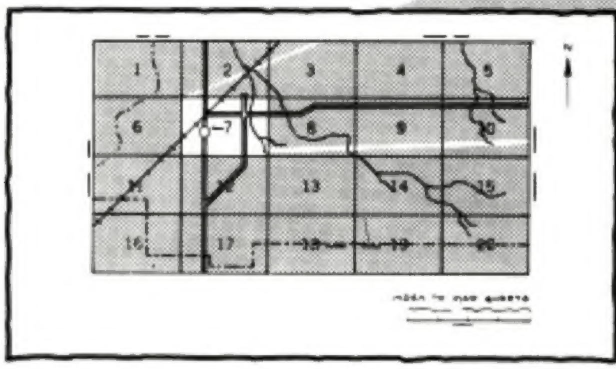
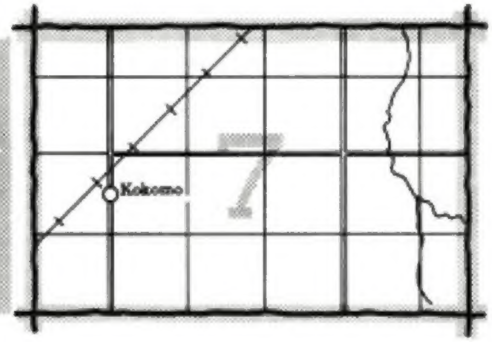
SOIL SURVEY OF
Faulkner County, Arkansas

United States Department of Agriculture
Soil Conservation Service
in cooperation with the
Arkansas Agricultural Experiment Station

HOW TO USE

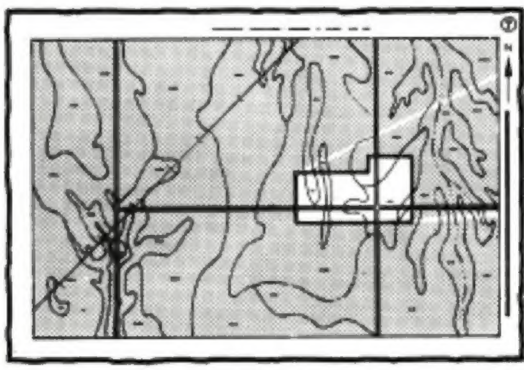
1. Locate your area of interest on the "Index to Map Sheets"

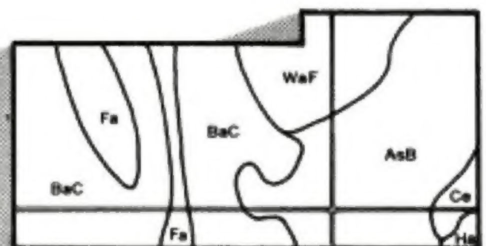




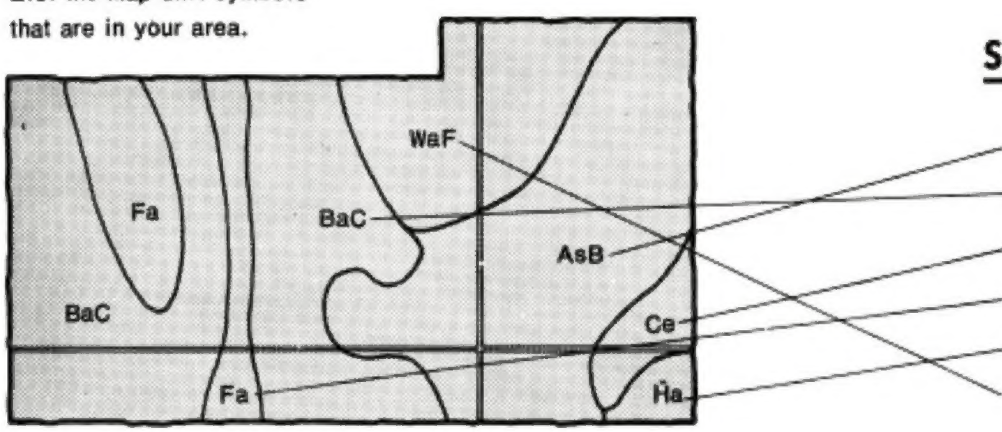
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area.

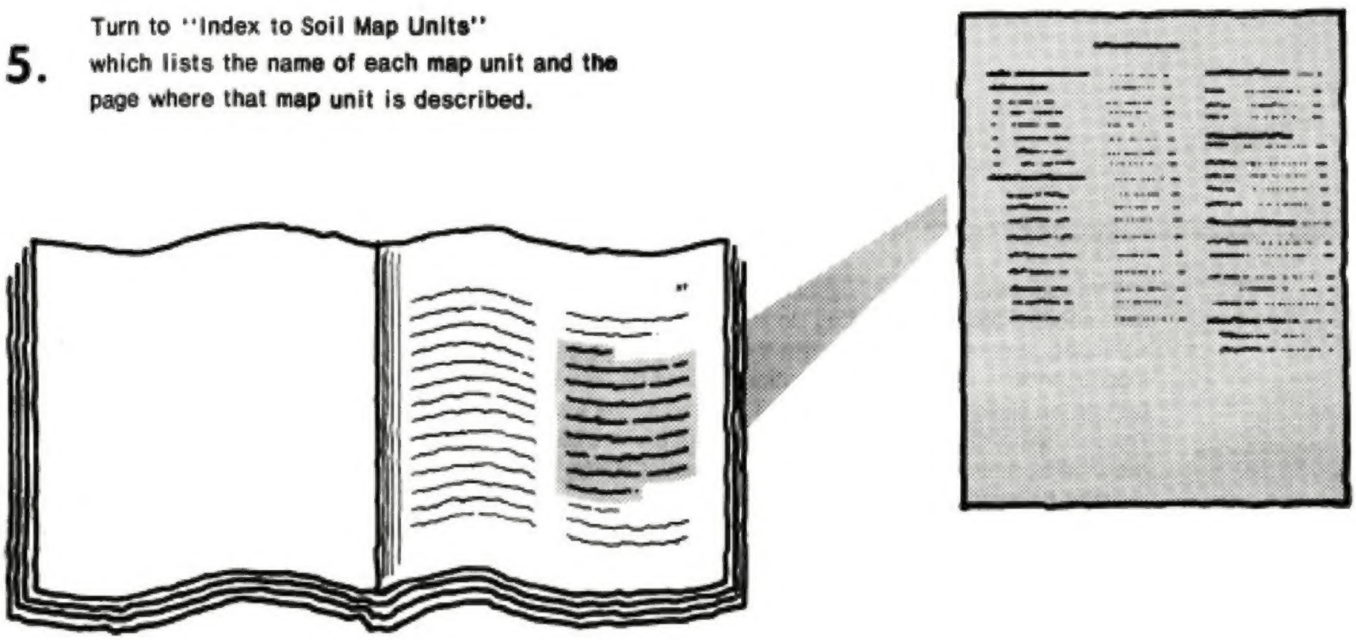


Symbols

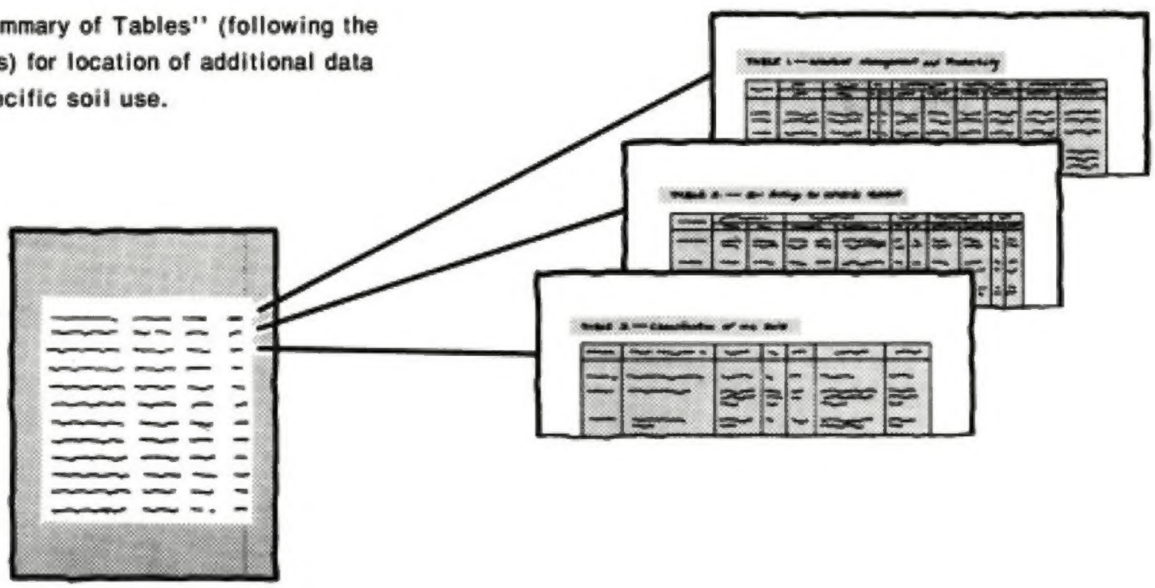
AsB
BaC
Ce
Fa
Ha
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1970-74. Soil names and descriptions were approved in 1975. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1975. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Faulkner County Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

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Issued February 1979

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Summary of Tables

Foreword

The Soil Survey of Faulkner County, Arkansas, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

M J Spears

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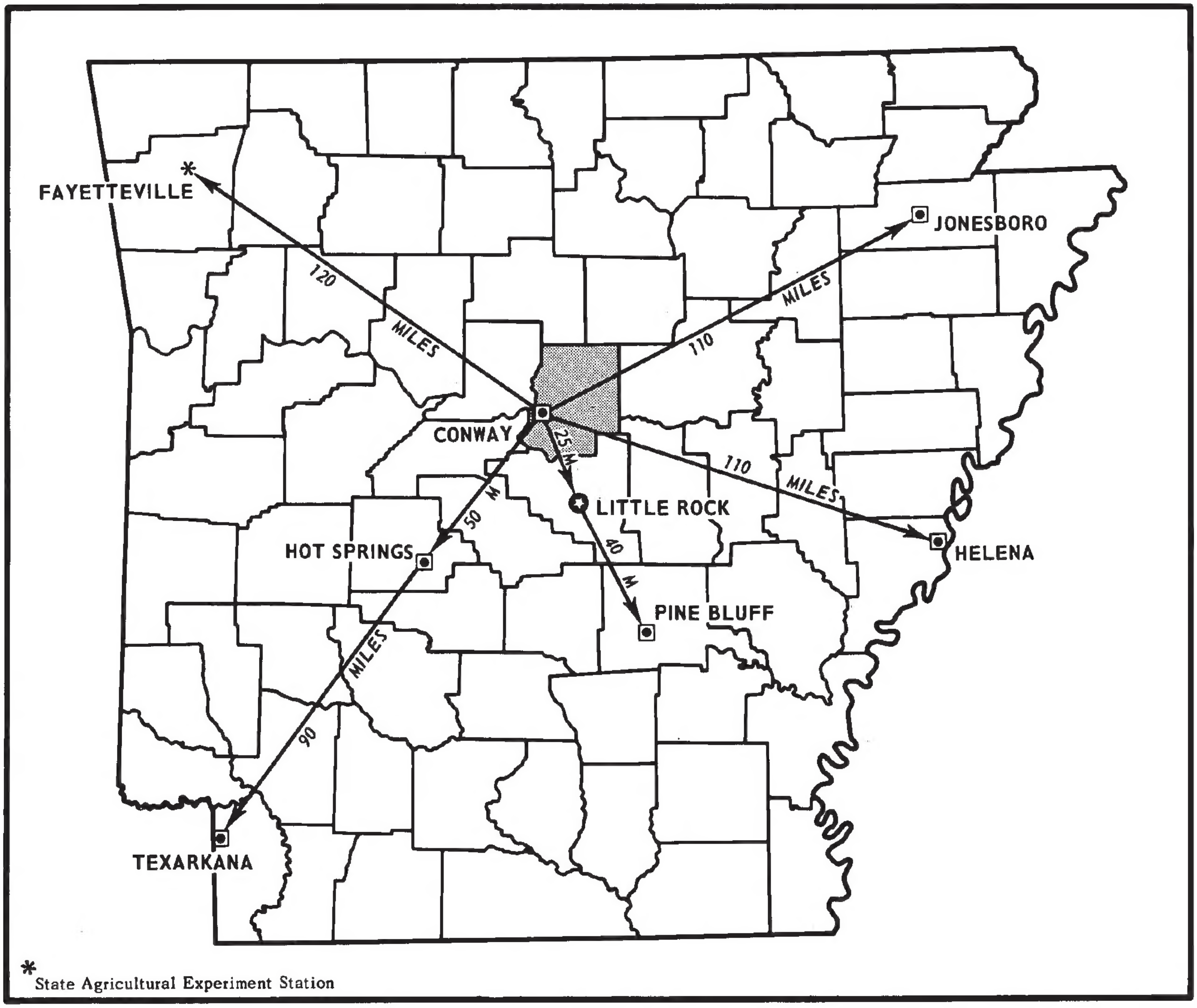
State Conservationist
Soil Conservation Service



Location of Faulkner County in Arkansas.

SOIL SURVEY OF FAULKNER COUNTY, ARKANSAS

By William R. Townsend and Curtis R. Wilson, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Arkansas Agricultural Experiment Station

FAULKNER COUNTY is in the central part of Arkansas (see facing page). The approximate land area is 410,304 acres, or 641 square miles. The population was 37,500 in 1970. Conway, the county seat, has a population of 16,772.

The county is in the Arkansas Valley and Ridges Major Land Resource Area. It is bounded on the north by Van Buren and Cleburne Counties, on the east by White and Lonoke Counties, on the south by Pulaski County, and on the west by Perry and Conway Counties. The Arkansas River is the southwest boundary.

Valleys and parallel ridges dominate the landscape. The elevation ranges from about 260 feet at the southwest corner to about 882 feet in the northeastern part of the county. The more fertile soils are on flood plains along Cadron Creek and the Arkansas River.

General nature of the county

In the paragraphs that follow is general information on the settlement of Faulkner County, the natural resources, the climate, and the farming.

Settlement

Vast forests of valuable species once covered the area that is now Faulkner County. The trees standing today are second or third growth and are only partial replacement for the giant trees cut by the first settlers for their new homes.

Faulkner County was formed in 1873 from Pulaski and Conway Counties. The population has increased from 12,785 in 1870 to 37,500 in 1970. The county is served by a railroad, interstate highways, and a navigable river. Farming continues to be the major enterprise.

Natural resources

Soil is the most important natural resource in the county. Livestock and crops are marketable products.

In most of the county, water is adequate for domestic use, livestock, and irrigation. The Arkansas River and its main tributaries, Cadron and Palarm Creeks, are major water sources.

The Arkansas River also provides economical transportation of raw materials for industries.

Climate

Faulkner County is hot in summer, especially at low elevations. It is moderately cool in winter, especially in the mountainous areas. Rainfall is fairly heavy and is well distributed throughout the year. Snow falls nearly every winter, but snow cover lasts only a few days.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Conway, Arkansas, for the period 1951 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 43 degrees F, and the average daily minimum temperature is 32 degrees. The lowest temperature on record, which occurred at Conway on February 2, 1951, is -13 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred on July 13, 1954, is 115 degrees.

Growing degree days, shown in table 1, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 25 inches, or 51 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 5.10 inches at Conway on January 30, 1969. Thunderstorms occur on about 57 days each year, and most occur in summer.

Rainfall is normally adequate for all crops in most years. The lower available water capacity in some of the loamy soils can result in brief periods of droughtiness.

Average seasonal snowfall is 5 inches. The greatest snow depth at any one time during the period of record was 8 inches. On the average, 1 day has at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is less than 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The percentage of possible sunshine is 72 in summer and 60 in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in March.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Farming

Early settlers in Faulkner County farmed the well drained soils above the flood plain of the Arkansas River, mainly in the upland valleys. The early settlers were subsistence farmers. Cotton, however, soon became the main cash crop. Consequently, most of the better drained areas were cleared for cotton. The steep, stony, or wet areas were left in woodland.

Farming has become more diversified, as shown in tables 4 and 5. It is generally more intensive on the bottom land than on the upland.

As a result of flood control, improved crop varieties, mechanization, insecticides, and other technological advances, most of the bottom land along the Arkansas River is now cropland and pasture. Most of the lowland has been cleared, and natural drainage has been improved on most farms for more reliable crop production.

Soybeans is the main crop on the bottom land. Rice, cotton, wheat, sorghums, oats, and spinach are also grown. Most farmers also keep herds of beef cattle.

In the uplands, beef cattle, forage crops, dairy cattle, and hogs provide most of the farm income.

In 1969, 56 percent of the land area of the county was in farms (7). The rest was wooded tracts, cities, and built-up areas.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a

basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

1. Spadra-Ouachita-Amy

Well drained and poorly drained, level and nearly level loamy soils on flood plains, natural levees, and terraces

This map unit is along creeks and small streams throughout the county. The soils formed in loamy alluvium on flood plains, natural levees, and terraces. Natural drainageways are mainly slow-flowing, intermittent streams.

The unit makes up about 4 percent of the county. It is about 30 percent Spadra soils, 30 percent Ouachita soils, 30 percent Amy soils, and 10 percent soils of minor extent.

Spadra soils are at slightly higher elevations than Ouachita or Amy soils. They are on terraces. Ouachita soils are on flood plains and natural levees. Amy soils are on flood plains that are frequently flooded. Spadra and Ouachita soils are well drained. Amy soils are poorly drained and have a seasonal high water table.

Minor in the unit are the somewhat poorly drained Taft soils and the moderately well drained Leadvale soils.

This unit is used mainly for cultivated crops. Small wet areas are used for woodland. Flooding and the high seasonal water table are the main limitations.

The potential is only fair for cultivated crops. Flood control and surface drains are needed for maximum protection. The potential is good for woodland, but harvesting the timber is limited to the drier seasons. The potential is poor for most urban uses. Flooding and wetness are the main limitations.

2. Leadvale-Taft

Moderately well drained and somewhat poorly drained, nearly level to gently sloping loamy soils on stream terraces, on benches, and in depressions

This map unit occurs as scattered areas throughout the county. The soils formed in residuum derived predominantly from shale. They are on stream terraces on benches and in depressions. Natural drainageways are mainly slow-flowing, intermittent streams.

The unit makes up about 32 percent of the county. It is about 64 percent Leadvale soils, 30 percent Taft soils, and 6 percent soils of minor extent.

Leadvale soils are at slightly higher elevations than Taft soils. They are moderately well drained, and Taft soils are somewhat poorly drained. Both have a silt loam surface layer and a seasonal high water table.

Minor in the unit are the poorly drained Amy soils and the well drained Linker and Pickwick soils.

Nearly all of this unit but the small areas of hardwoods along drainageways is used for pasture. Wetness is the main limitation. The water table is within 12 to 24 inches of the surface in winter and early in spring.

The potential is only fair for row crops. Fieldwork can be delayed several days after a rain because of excess water. Surface drains are needed. The potential is good for woodland. There are no significant limitations. The potential is fair for most urban uses. Wetness and low strength are the main limitations.

3. Linker-Mountainburg

Well drained, nearly level to steep loamy, gravelly and stony soils on benches, ridges, hilltops, and mountaintops

This map unit occurs as scattered areas throughout the county. The soils formed in loamy residuum derived from sandstones and shale. They are on benches, ridges, hilltops, and mountaintops. Natural drainageways are mainly fast-flowing, intermittent streams.

The unit makes up about 57 percent of the county. It is about 47 percent Linker soils, 40 percent Mountainburg soils, and 13 percent soils of minor extent.

Linker soils, which are on mountaintops, upper side slopes, and benches, are moderately deep over bedrock. Mountainburg soils, which also are on mountaintops, upper side slopes, and benches, are shallow over bedrock. Both are well drained. The surface layer is fine sandy loam, gravelly fine sandy loam, or very stony fine sandy loam.

Nearly all of this unit but the small areas of hardwoods along ridges and mountaintops is used for pasture. The stony surface and droughtiness are the main limitations.

The potential is poor for row crops because of the low available water capacity, depth to rock, and stony surface. The potential is fair for woodland. Slopes and available water capacity are the main limitations. The potential is also only fair for most urban uses. The slope and depth to bedrock are the main limitations.

4. Roxana-Gallion

Well drained, level and nearly level loamy soils on flood plains, natural levees, and terraces

This map unit is in the southwestern part of the county. The soils formed in loamy alluvium on flood plains, natural levees, and terraces along the Arkansas River. Natural drainageways are slow-flowing, intermittent streams.

The unit makes up about 1 percent of the county. It is about 59 percent Roxana soils, 36 percent Gallion soils, and 5 percent soils of minor extent.

Roxana soils are at slightly lower elevations than Gallion soils. They are on flood plains. Gallion soils are on natural levees and terraces. Both are well drained. Roxana soils have a very fine sandy loam surface layer. Gallion soils have a silt loam surface layer.

Minor in the unit are the somewhat poorly drained Moreland soils and the poorly drained Perry soils.

The unit is used mainly for cultivated crops. Areas between levees and the river are occasionally flooded.

The potential is good for cultivated crops. The occasional flooding between levees and the river is the main limitation. The potential is good for woodland. There are no significant limitations. The potential is good for urban uses in areas protected from flooding.

5. Muskogee-Sallisaw

Moderately well drained and well drained, nearly level to moderately sloping loamy and gravelly soils on stream and river terraces

This map unit is in the south central part of the county. The soils formed in a thin loamy layer and the underlying clayey alluvium and in loamy and gravelly alluvium on high stream and river terraces. Natural drainageways are mainly slow-flowing, intermittent streams.

The unit makes up about 1 percent of the county. It is about 50 percent Muskogee soils, 25 percent Sallisaw soils, and 25 percent soils of minor extent.

Muskogee soils, which are at slightly lower elevations than Sallisaw soils, are moderately well drained. Sallisaw soils are well drained. Muskogee soils have a silt loam surface layer. Sallisaw soils have a gravelly sandy loam surface layer.

Minor in the unit are the somewhat poorly drained Acadia soils and the well drained McKamie soils.

The unit is mainly pasture. There are no significant limitations. A few small areas of hardwoods are along drainageways.

The potential is fair for row crops. Erosion is the main limitation. The potential is good for woodland. There are no significant limitations. The potential is fair for urban uses. High shrink-swell potential and low strength are the main limitations.

6. Moreland-Perry

Poorly drained and somewhat poorly drained, level clayey soils in back swamps of the Arkansas River

This map unit is in the southwestern part of the county. These soils formed in clayey sediments in back swamps of the Arkansas River. Natural drainageways are mainly slow-flowing, intermittent streams.

The unit makes up about 5 percent of the county. It is about 50 percent Moreland soils, 40 percent Perry soils, and 10 percent soils of minor extent.

Moreland soils are at slightly higher elevations than Perry soils. They are somewhat poorly drained. Perry soils are poorly drained. Moreland soils have a silty clay surface layer. Perry soils have a clay surface layer. Both have a seasonal high water table.

Minor in this unit are the very poorly drained Yorktown soils.

Except for small areas of mixed hardwoods along drainageways, the unit is used for cultivated crops and rice. Wetness is the main limitation. The water table is within 12 inches of the surface in winter and early in spring.

The potential is good for cultivated crops. Fieldwork is commonly delayed several days after a rain. Surface drains are needed. The potential is good for woodland. Harvesting the timber is usually limited to the drier seasons. The potential is poor for urban uses. Wetness and high shrink-swell potential are the main limitations.

Broad land use considerations

Nearly 9 percent of Faulkner County, or an estimated 37,000 acres, is urban or built-up land. Each year a considerable acreage is developed in Conway, Greenbrier, Mayflower, and other areas of the county. Generally the soils in the survey area that have good potential for cultivated crops also have good potential for urban development.

The general soil map is helpful in planning the general outline of urban areas, but it should not be used in selecting sites for specific urban structures. Data on specific soils in this survey can be helpful in planning future land use patterns.

Many areas of the county can be developed for urban use at reasonable extra cost. Among these areas are parts of the Roxana-Gallion map unit that are not flooded, gently sloping areas in the Linker-Mountainburg unit, and parts of the Leadvale-Taft unit where drainage has been improved and a central sewer system is available. Some soils in the Leadvale-Taft unit are slowly permeable and have poor natural drainage.

Areas where the soils are severely limited for urban development are in the Moreland-Perry map unit and the Spadra-Ouachita-Amy unit, both of which are on flood plains that are sometimes flooded and occasionally ponded. Urban development is also costly on some soils in the Muskogee-Sallisaw map unit and on the steep, stony soils of the Linker-Mountainburg unit. The steep to nearly level soils in the Linker-Mountainburg unit are shallow to only moderately deep over hard bedrock. The potential is poor on the clayey soils of the Moreland-Perry unit because of the high shrink-swell potential and fair to poor on the fragipan soils of the Leadvale-Taft unit because of wetness and the low strength.

In some areas, the soils have good potential for farming but poor potential for nonfarm uses, for example, the Spadra-Ouachita-Amy and Moreland-Perry units. Flooding is a severe limitation for urban development on the Spadra-Ouachita-Amy unit. Wetness is a severe limitation for nonfarm use on the Moreland-Perry unit. If adequately drained, all of these soils have good potential for farm crops.

The fact that the Roxana-Gallion unit is excellent farmland should not be overlooked when broad land uses are considered. This unit is suited to vegetables and other specialty crops. The Leadvale-Taft unit has good potential for pasture and hay crops. Soils in the Linker-Mountainburg unit are well drained and warm early in spring. They are well suited to nurseries in areas where depth to bedrock is not a limitation.

Most soils in the county have good or fair potential for woodland. The Spadra-Ouachita-Amy, Leadvale-Taft, Muskogee-Sallisaw, and Moreland-Perry units contain wet soils on which tree harvesting is usually limited to the drier seasons. The Roxana-Gallion unit has good potential for woodland, but it is used mostly for cultivated crops.

The less sloping parts of the Linker-Mountainburg unit have good potential as sites for parks and extensive recreation areas. Scattered hardwoods enhance the beauty of much of the unit. Undrained areas of the Spadra-Ouachita-Amy and the Moreland-Perry units are good as nature study areas. All provide habitat for many species of wildlife.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil associations and undifferentiated groups.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Linker-Mountainburg association, hilly, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Amy soils, frequently flooded, is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 6, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

1—Acadia silt loam. This deep, level to nearly level, somewhat poorly drained soil is on stream terraces. Slopes are less than 2 percent. Areas range from about 60 to 300 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 4 inches thick. The subsurface layer is grayish brown, mottled silt loam about 8 inches thick. The upper 6 inches of the subsoil is yellowish brown, mottled light silty clay loam. The lower 36 inches is gray, mottled silty clay. The underlying material is gray, mottled clay that extends to 78 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Muskogee soils and a few scattered mounds of well drained soils. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is medium acid to very strongly acid. Reaction is strongly acid or very strongly acid in the subsoil and mildly alkaline to very strongly acid in the underlying material. Permeabili-

ty is very slow. The available water capacity is high. The water table is seasonally high. The soil is wet during winter and early in spring.

This soil responds well to fertilization. If it is adequately drained and properly managed, row crops that leave large amounts of crop residue can be grown year after year.

The potential is good for most crops commonly grown in the county. The principal cultivated crop is soybeans. This soil has good potential for pasture. Suitable pasture plants are common bermudagrass, tall fescue, bahiagrass, white clover, annual lespedeza, and sericea lespedeza.

The potential is good for loblolly pine, water oak, and sweetgum. Most of the acreage is mixed hardwood forest. Wetness is the main limitation in managing and harvesting the tree crop. This limitation can usually be overcome by logging during the drier seasons.

The potential is poor for most urban uses. Wetness, very slow permeability, and a seasonal high water table are severe limitations for dwellings, streets, industrial sites, and septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIIw-1; woodland suitability group 3w8; pasture and hayland group 8F.

2—Amy soils, frequently flooded. This map unit consists of Amy silt loam and similar soils with a loam or fine sandy loam surface layer. These are level, poorly drained soils on flood plains along drainageways. They are flooded two or three times a year. The slope is less than 1 percent. Areas range from about 20 to 600 acres.

Typically, the surface layer is grayish brown silt loam about 6 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 6 inches thick. The upper 6 inches of the subsoil is gray, mottled silty clay loam. The lower 22 inches is light gray, mottled silty clay loam. The underlying material is gray, mottled silt loam that extends to 60 inches or more.

Included with these soils in mapping are a few small areas of moderately well drained Leadvale soils, well drained Ouachita soils, and somewhat poorly drained Taft soils. These included areas make up about 10 percent of the map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is slow. The water table is seasonally high.

The potential is poor for cultivated crops because of the frequent flooding. In most years flooding occurs during the period November through June. This soil has good potential for pasture. Suitable pasture plants are bermudagrass, tall fescue, johnsongrass, white clover, sericea lespedeza, and annual lespedeza.

This unit is mostly wooded (fig. 1). The potential is good for sweetgum, eastern cottonwood, green ash, American sycamore, and Nuttall oak. Wetness and flooding limit the use of equipment in managing and harvesting the tree crop. These limitations can be overcome by using special equipment and logging during the drier seasons.

The potential is poor for urban uses. Wetness and flooding, the main limitations, can be overcome only by drainage and major flood control. Capability unit Vw-1; woodland suitability group 2w6; pasture and hayland group 2B.

3—Enders gravelly fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on ridgetops, side slopes, and plateaus. Areas range from about 15 to 160 acres.

Typically, the surface layer is brown gravelly fine sandy loam about 3 inches thick. The subsurface layer is strong brown gravelly loam about 5 inches thick. The upper 24 inches of the subsoil is yellowish red, mottled silty clay loam. The lower 24 inches is red, mottled clay. The underlying material is variegated gray, red, and black fragments of shale extending to 86 inches or more.

Included with this soil in mapping are a few small areas of well drained Linker and Mountainburg soils. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is medium, and the erosion hazard is severe.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is poor for row crops. Nearly all the acreage is pasture. This soil has poor to fair potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are tall fescue, bahiagrass, white clover, sericea lespedeza, and annual lespedeza. Winter small grain can be grown. The major limitations are the clayey subsoil and the medium available water capacity.

The potential is fair for loblolly pine, shortleaf pine, and redcedar. The clayey subsoil and the medium available water capacity are the main limitations.

The potential is poor for most urban uses. The shrink-swell potential is a severe limitation for streets, dwellings, and industrial sites. Very slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IVe-1; woodland suitability group 4o1; pasture and hayland group 8C.

4—Enders gravelly fine sandy loam, 8 to 12 percent slopes. This deep, well drained, moderately sloping soil is on ridgetops, side slopes, and plateaus. Areas range from about 20 to 100 acres.

Typically, the surface layer is brown gravelly fine sandy loam about 3 inches thick. The subsurface layer is strong brown gravelly loam about 5 inches thick. The upper 24 inches of the subsoil is yellowish red, mottled silty clay loam. The lower 24 inches is red, mottled clay. The underlying material is variegated gray, red, and black fragments of shale extending to 86 inches or more.

Included with this soil in mapping are a few small areas of well drained Linker and Mountainburg soils. Also included are small areas where the subsoil is 15 to 35 per-

cent fragments of shale and sandstone. These included areas make up about 15 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly or very strongly acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is poor for row crops. Nearly all the acreage is pasture. This soil has poor to fair potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are tall fescue, bahiagrass, white clover, sericea lespedeza, and annual lespedeza. Winter small grain can be grown.

The potential is fair for loblolly pine, shortleaf pine, and redcedar. The clayey subsoil, the risk of erosion, and the medium available water capacity are the main limitations.

The potential is poor for most urban uses. The shrink-swell potential is a severe limitation for streets, dwellings, and industrial sites. Very slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit VIe-1; woodland suitability group 4o1; pasture and hayland group 8C.

5—Enders gravelly fine sandy loam, 12 to 45 percent slopes. This deep, well drained, steep to very steep soil is on ridgetops and side slopes. Areas range from about 20 to 300 acres.

Typically, the surface layer is brown gravelly fine sandy loam about 3 inches thick. The subsurface layer is strong brown gravelly loam about 5 inches thick. The upper 24 inches of the subsoil is yellowish red silty clay loam. The lower 24 inches is red, mottled clay. The underlying material is variegated gray, red, and black fragments of shale extending to 86 inches or more.

Included with this soil in mapping are a few small areas of well drained Linker and Mountainburg soils. Also included are a few small areas where the subsoil, rock outcrop, and breaks are 15 to 35 percent fragments of sandstone and shale. These included areas make up about 20 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe.

This soil responds well to fertilization, but the potential is poor for row crops. This soil has poor potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, tall fescue, and weeping lovegrass. Winter small grain can be grown. The major limitations are the slope, the erosion hazard, the clayey subsoil, and the medium available water capacity.

The potential is fair for loblolly pine, shortleaf pine, and redcedar. Nearly all the acreage is mixed hardwood forest. The clayey subsoil, the medium available water capacity, and the steep slopes are the main limitations (fig. 2).

The potential is poor for most urban uses. The high shrink-swell potential and the slope are severe limitations for streets, dwellings, and industrial sites. Very slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit VIIe-1; woodland suitability group 4r3; pasture and hayland group 8D.

6—Gallion silt loam. This deep, level, well drained soil is on natural levees and low terraces along the Arkansas River. Slopes are less than 1 percent. Areas range from about 40 to 300 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The upper 30 inches of the subsoil is reddish brown silty clay loam. The lower 26 inches is reddish brown and dark reddish brown silt loam. The underlying material is reddish brown very fine sandy loam extending to 81 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Moreland soils and well drained Roxana soils and small areas that are sometimes flooded less than once every 2 years. Also included are small areas where the surface layer is 10 to 15 inches of very fine sandy loam over very dark brown silt loam and areas where the lower part of the subsoil is loam or clay loam. These included areas make up about 15 percent of this map unit.

Natural fertility is high. Organic matter content is low. The surface layer ranges from medium acid to neutral, and the subsoil and underlying material from slightly acid to moderately alkaline. Permeability is moderate. The available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most crops commonly grown in the county. Nearly all the acreage is cultivated. The principal crop is soybeans. Other crops are cotton, corn, small grain, and truck crops. This soil has good potential for pasture. Suitable pasture plants are bermudagrass, bahiagrass, tall fescue, white clover, and annual lespedeza.

The potential is good for eastern cottonwood and American sycamore. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Low strength, affecting roads and streets, and moderate shrink-swell potential, affecting building foundations, are the main limitations. Permeability is a moderate limitation for septic tank absorption fields. These limitations can be overcome by proper engineering design. Capability unit I-1; woodland suitability group 2o4; pasture and hayland group 2A.

7—Gallion silt loam, occasionally flooded. This deep, level, well drained soil is on natural levees along the Arkansas River. This soil is not protected by a levee and is flooded less often than once every 2 years. Slopes are less than 1 percent. Areas range from about 40 to 200 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The upper 30 inches of the subsoil is reddish brown silty clay loam. The lower 26 inches is reddish brown and dark reddish brown silt loam. The underlying material is reddish brown very fine sandy loam extending to 81 inches or more.

Included with this soil in mapping are a few small areas of well drained Roxana soils. Also included are small low areas that are flooded for short periods at least once every 2 years. These included areas make up about 10 percent of this map unit.

Natural fertility is high. Organic matter content is low. The surface layer ranges from medium acid to neutral, and the subsoil and underlying material from slightly acid to moderately alkaline. Permeability is moderate. The available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most row crops commonly grown in the county. Nearly all the acreage is cultivated. The principal crop is soybeans. Other suitable crops are corn and small grain. This soil has good potential for pasture. Suitable pasture plants are bermudagrass, bahiagrass, tall fescue, white clover, and annual lespedeza.

The potential is good for eastern cottonwood and American sycamore. There are no significiant limitations in woodland use or management.

The potential is poor for most urban uses. Occasional flooding is a hazard between November and June. Flooding, the main limitation, can be overcome only by major flood control measures. Capability unit IIw-1; woodland suitability group 2o4; pasture and hayland group 2A.

8—Leadvale silt loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on slightly concave toe slopes, benches, and terraces. Areas range from about 10 to 200 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The upper 18 inches of the subsoil is yellowish brown silt loam. The lower 38 inches is compact and brittle, yellowish brown and brownish yellow, mottled silty clay loam. The underlying material is yellowish brown silt loam extending to 73 inches or more.

Included with this soil in mapping are a few small areas of poorly drained Amy soils and somewhat poorly drained Taft soils. Also included are small areas where redder colors occur in the upper part of the subsoil, and areas of soils that have loam texture in the subsoil. These included areas make up about 10 percent of the map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. The water table is within 24 inches of the surface during winter and early in spring.

Ths soil responds well to fertilization. It is easy to keep in good tilth. The firm, brittle layer in the subsoil restricts root penetration and slows the movement of water.

The potential is fair for most row crops commonly grown in the county. Soybeans is the principal cultivated crop. Other crops are cotton, corn, and wheat. Winter small grain can be grown.

Most of the acreage is pasture. This soil has fair to good potential for pasture. Suitable pasture plants are bahiagrass, common bermudagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is good for loblolly pine, shortleaf pine, and redcedar. There are no major limitations in woodland use or management.

The potential is fair for most urban uses. The seasonal high water table and low strength are moderate limitations for dwellings, streets, and industrial sites. The moderately slow permeability and a seasonal high water table are severe limitations for septic tank absorption fields. Drainage to lower the water table and proper design of the absorption field are needed. Capability unit IIe-1; woodland suitability group 4o7; pasture and hayland group 8A.

9—Leadvale silt loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on slightly concave toe slopes, benches, and terraces. Areas range from 10 to 300 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The upper 18 inches of the subsoil is yellowish brown silt loam. The lower 38 inches is compact and brittle, yellowish brown and brownish yellow, mottled silty clay loam. The underlying material is yellowish brown silt loam extending to 73 inches or more.

Included with this soil in mapping are a few small areas of well drained Linker soils and areas where redder colors occur in the upper part of the subsoil. These included areas make up about 15 percent of this map unit.

Natural fertility and organic matter content are low. Except in a limed surface layer, reaction is strongly acid or very strongly acid. Permeability is moderately slow. The available water capacity is medium. The water table is within 24 inches of the surface during winter and early in spring.

This soil responds well to fertilization and is easy to keep in good tilth. The firm, brittle layer in the subsoil restricts root penetration and slows the movements of water.

The potential is fair for most row crops commonly grown in the county. Soybeans is the principal cultivated crop. Other crops are cotton, corn, oats, and wheat.

Most of the acreage is pasture. This soil has fair to good potential for pasture. Suitable pasture crops are bahiagrass, common bermudagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is good for loblolly pine, shortleaf pine, and redcedar. There are no major limitations in woodland use or management.

The potential is fair for most urban uses. The seasonal high water table and low strength are moderate limitations for dwellings, streets, and industrial sites. The moderately slow permeability and the seasonal high water

table are severe limitations for septic tank absorption fields. Drainage to lower the water table and proper design of the absorption field are needed. Capability unit IIIe-1; woodland suitability group 4o7; pasture and hayland group 8A.

10—Linker fine sandy loam, 1 to 3 percent slopes. This moderately deep, well drained, nearly level soil is on mountaintops, upper side slopes, and deep benches. Areas range from about 10 to 100 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 10 inches thick. The upper 10 inches of the subsoil is yellowish red sandy clay loam, and the lower 13 inches is red, mottled sandy clay loam. Hard sandstone bedrock is at a depth of 37 inches.

Included with this soil in mapping are a few small areas of the moderately well drained Leadvale soil and the well drained Mountainburg soil. Also included are small areas where the subsoil is silty, areas underlain by shale, and areas where the subsoil is browner. These included areas make up about 10 percent of the map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is medium.

The soil responds well to fertilization. It is easy to keep in good tilth.

The potential is poor for row crops and small grain. Nearly all the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, white clover, tall fescue, sericea lespedeza, and annual lespedeza.

The potential is fair for shortleaf pine, loblolly pine, and redcedar. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Depth to bedrock is a moderate limitation for streets, dwellings, and industrial sites. It is a severe limitation for septic tank absorption fields. This limitation is difficult or impractical to overcome. Capability unit IIe-1; woodland suitability group 4o1; pasture and hayland group 8A.

11—Linker fine sandy loam, 3 to 8 percent slopes. This moderately deep, well drained, gently sloping soil is on mountaintops, upper side slopes, and deep benches. Areas range from about 10 to 200 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 10 inches thick. The upper 10 inches of the subsoil is yellowish red sandy clay loam. The lower 13 inches is red, mottled sandy clay loam. Hard sandstone bedrock is at a depth of 37 inches.

Included with this soil in mapping are a few small areas of the moderately well drained Leadvale soil and the well drained Mountainburg soil. Also included are small areas where the subsoil is silty, areas underlain by shale, and areas where the subsoil is browner. These included areas make up about 15 percent of the map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is medium.

The soil responds well to fertilization. It is easy to keep in good tilth.

The potential is poor for row crops and small grain. Nearly all the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, white clover, tall fescue, sericea lespedeza, and annual lespedeza. The major limitation is a medium available water capacity.

The potential is fair for shortleaf pine, loblolly pine, and redcedar. There are no significant limitations in woodland use and management.

The potential is fair for most urban uses. The depth to bedrock and the slope are moderate limitations for streets, dwellings, and industrial sites. The depth to bedrock is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIIe-1; woodland suitability group 4o1; pasture and hayland group 8A.

12—Linker fine sandy loam, 8 to 12 percent slopes. This moderately deep, well drained, moderately sloping soil is on mountaintops, side slopes, and deep benches. Areas range from 10 to 250 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 10 inches thick. The upper 10 inches of the subsoil is yellowish red sandy clay loam. The lower 13 inches is red, mottled sandy clay loam. Hard sandstone bedrock is at a depth of 37 inches.

Included with this soil in mapping are a few small areas of the well drained Mountainburg soil. Also included are small areas where the subsoil is silty, areas underlain by shale, and areas where the subsoil is browner. These included areas make up about 15 percent of the unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid. Permeability is moderate. The available water capacity is medium.

Runoff is moderate to rapid, and the hazard of erosion is moderate. The soil responds well to fertilization, and is easy to keep in good tilth.

The potential is poor for row crops and small grain. Nearly all the acreage is pasture. This soil has fair potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, white clover, tall fescue, sericea lespedeza, and annual lespedeza. The major limitation is a medium available water capacity.

The potential is fair for shortleaf pine, loblolly pine, and redcedar. There are no significant limitations in woodland use and management.

The potential is poor for most urban uses. Slope and depth to bedrock are moderate to severe limitations for

streets, dwellings, industrial sites, and septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IVe-1; woodland suitability group 4o1; pasture and hayland group 8A.

13—Linker-Mountainburg association, rolling. This association is about 50 percent well drained, moderately deep Linker soil; 40 percent well drained, shallow Mountainburg soil; 10 percent well drained, deep Enders soil; small areas of sandstone outcrop; and areas where slopes are less than 8 percent. The landscape is mainly moderately sloping ridgetops, upper side slopes, ledges, and benches. The Linker soil is on ridgetops, side slopes, and benches. The Mountainburg soil is on ledges and upper slopes. Both formed in material weathered from sandstone. Slopes range from 8 to 12 percent. Areas range from 80 to 250 acres.

In a typical profile of the Linker soil, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 10 inches thick. The upper 10 inches of the subsoil is yellowish red sandy clay loam. The lower 13 inches is red, mottled sandy clay loam. Hard sandstone bedrock is at a depth of 37 inches.

The Linker soil has moderate permeability and medium available water capacity. Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

In a typical profile of the Mountainburg soil, the surface layer is very dark grayish brown gravelly fine sandy loam about 2 inches thick. The subsurface layer is strong brown and yellowish brown gravelly fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard, massive, sandstone bedrock is at a depth of 13 inches.

The Mountainburg soil has moderately rapid permeability and low available water capacity. Natural fertility and organic matter content are low. Reaction is medium acid or strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil.

The potential for pasture is fair if the soil is kept in permanent cover and protected from overgrazing. Suitable pasture crops are tall fescue, bahiagrass, common bermudagrass, weeping lovegrass, sericea lespedeza, and annual lespedeza. Runoff is moderate to rapid, and the hazard of erosion is moderate. Controlled grazing, fertilization, and weed and brush control are needed.

The potential for shortleaf pine, loblolly pine, and eastern redcedar is fair on Linker soil and poor on Mountainburg soil. Both soils have a restricted root zone and a limited available water capacity. Stones in the Mountainburg soil are a moderate limitation for new seedlings and a severe limitation for equipment. Scattered blackjack oak, post oak, and redcedar are in some areas.

The potential is poor for most urban uses. Slope and depth to bedrock, the main limitations, are costly to overcome. Linker soil in capability unit IVe-1, woodland suitability group 4o1, pasture and hayland group 8A. Mountainburg soil in capability unit VIe-1, woodland suitability group 5d2, pasture and hayland group 14A.

14—Linker-Mountainburg association, hilly. This association is about 45 percent well drained, moderately deep Linker soil, 40 percent well drained, shallow Mountainburg soil; 15 percent well drained, deep Enders soil; small areas of sandstone rock outcrop, and areas with slopes of less than 12 percent. It occurs in a regular pattern on moderately steep to steep side slopes, ledges, and benches. Linker soil is on side slopes and in deeper benches. Mountainburg soil is on ledges and in shallow benches. Slopes range from 12 to 40 percent. These soils formed in material weathered from sandstone. Areas range from 80 to 300 acres.

In a typical profile of Linker soil, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 10 inches thick. The upper 10 inches of the subsoil is yellowish red sandy clay loam. The lower 13 inches is red, mottled sandy clay loam. Hard sandstone bedrock is at a depth of 37 inches.

Linker soil has moderate permeability and medium available water capacity. Natural fertility and organic matter content are low. Reaction is medium acid or strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil.

In a typical profile of Mountainburg soil, the surface layer is dark brown very stony fine sandy loam about 5 inches thick. The subsurface layer is strong brown very stony fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard massive sandstone bedrock is at a depth of 16 inches.

Mountainburg soil has moderately rapid permeability and low available water capacity. Natural fertility and organic matter content are low. Reaction is medium acid or strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil.

The potential is poor for pasture. Most areas are unimproved pasture. Some are idle. Permanent cover and protection from overgrazing are necessary to control erosion. Suitable pasture crops include tall fescue, bahiagrass, common bermudagrass, weeping lovegrass, sericea lespedeza, and annual lespedeza. Runoff is rapid and the hazard of erosion is severe. Controlled grazing, fertilization, weed and brush control, and stone removal are needed on the Mountainburg soil.

The potential for shortleaf pine, loblolly pine, and redcedar is fair on Linker soil and poor on Mountainburg soil. These soils have a restricted root zone and limited available water capacity. Stones in the Mountainburg soil are a severe limitation for new seedlings and equipment.

The potential is poor for most urban uses. Depth to bedrock, slope, and stoniness, which are the main limitations, are costly to overcome. Linker soil in capability unit VIe-1, woodland suitability group 4r3, pasture and hayland group 8B. Mountainburg soil in capability unit VIIs-1, woodland suitability group 5x3, pasture and hayland group 14B.

15—McKamie silty clay loam, 3 to 8 percent slopes, severely eroded. This deep, well drained, gently sloping soil is on dissected high stream terraces. Areas range from 10 to 40 acres.

Typically, the surface layer is yellowish red silty clay loam about 2 inches thick. Most of the original surface layer has been lost through erosion. The present layer is mostly subsoil material. The upper 6 inches of the subsoil is red silty clay. Below this is red clay that extends to 72 inches or more.

Included with this soil in mapping are a few small areas of the moderately well drained Muskogee soils and small areas of short steep slopes where gullies have formed. These included areas make up about 10 percent of this unit.

Natural fertility is moderate. Organic matter content is low. Reaction in the upper 46 inches ranges from medium acid to very strongly acid, unless the surface layer has been limed. Below 46 inches, the soil is neutral or mildly alkaline. Permeability is very slow. The available water capacity is medium.

The potential is poor for row crops. Most of the acreage is pasture. This soil has poor to fair potential for pasture. Suitable pasture crops are bahiagrass, common bermudagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza. The major limitation is the thin surface layer and clay subsoil. The soil erodes easily, and erosion is a severe hazard. The tight clay subsoil restricts root penetration and movement of water.

The potential is fair for shortleaf pine. Because the tight clay subsoil restricts roots, seedling mortality is moderate.

The potential is poor for most urban uses. The high shrink-swell potential and the low strength are severe limitations for dwellings, streets, and industrial sites. The very slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit VIe-1; woodland suitability group 3c2; pasture and hayland group 8C.

16—Moreland silty clay. This deep, somewhat poorly drained, level soil is on back swamps of the Arkansas River. Slopes are less than 1 percent. Areas range from 40 to 300 acres.

Typically, the surface layer is dark reddish brown silty clay about 4 inches thick. The upper 21 inches of the subsoil is dark reddish brown silty clay. The next 22 inches is dark reddish brown, mottled silty clay. Below this is reddish brown, mottled silty clay that extends to 76 inches or more.

Included with this soil in mapping are a few small areas of the well drained Gallion soils and the poorly drained Perry soils. Also included are areas where the surface layer is clay and a few small areas that are flooded for short periods no more than once every 2 years. These included areas make up about 10 percent of the map unit.

Natural fertility is high. Organic matter content is medium. Reaction ranges from slightly acid to mildly alkaline in the surface layer and from neutral to moderately alkaline in the subsoil. Permeability is very slow. The available water capacity is high. The seasonally high water table is within 18 inches of the surface during winter and early in spring.

This soil responds well to fertilization. It is difficult to keep in good tilth because of the high clay content in the surface layer. It cracks when dry and expands when wet. It becomes cloddy if plowed when wet.

The potential is good for most crops commonly grown in the county. Most of the acreage is cultivated. The principal crops are rice and soybeans. Other crops are cotton and grain sorghum. Fieldwork is commonly delayed several days after a rain. Surface drainage may be needed. This soil has good potential for pasture. Suitable pasture crops are common bermudagrass, Coastal bermudagrass, bahiagrass, tall fescue, and white clover.

The potential is good for eastern cottonwood, American sycamore, and sweetgum. Wetness is the main limitation in managing and harvesting the tree crop. This limitation can be overcome by logging during the drier seasons.

The potential is poor for most urban uses. Wetness and the high shrink-swell potential are severe limitations for dwellings, streets, and industrial sites. The very slow permeability and the seasonal high water table are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIIw-2; woodland suitability group 2w6; pasture and hayland group 1A.

17—Mountainburg gravelly fine sandy loam, 3 to 8 percent slopes. This shallow, well drained, gently sloping soil is on ridgetops and hillsides. Areas range from about 40 to 160 acres.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 2 inches thick. The subsurface layer is strong brown and yellowish brown gravelly fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard, massive sandstone bedrock is at a depth of 13 inches.

Included with this soil in mapping are a few small areas of the well drained Enders soils and Linker soils. Also included are small areas of shale breaks. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low.

This soil responds well to fertilization. Tilth is difficult to maintain because of coarse fragments.

The potential is poor for row crops. Nearly all the acreage is pasture. This soil has fair potential for pasture. The principal pasture crop is common bermudagrass. Bahiagrass and weeping lovegrass are also suitable. The major limitations are the depth to bedrock and the low available water capacity.

The potential is poor for shortleaf pine, loblolly pine, and redcedar. A limited root zone and the low available water capacity restrict tree growth.

The potential is poor for most urban uses. The depth to bedrock is a severe limitation that is costly to overcome. Capability unit IVe-1; woodland suitability group 5d2; pasture and hayland group 14A.

18—Mountainburg gravelly fine sandy loam, 8 to 12 percent slopes. This shallow, well drained, moderately sloping soil is on ridgetops and hillsides. Areas range from about 40 to 200 acres.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 2 inches thick. The subsurface layer is strong brown and yellowish brown gravelly fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard, massive sandstone bedrock is at a depth of 13 inches.

Included with this soil in mapping are a few small areas of the well drained Enders soils and Linker soils. Also included are small areas of shale breaks. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Reaction is medium acid or strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil. Permeability is moderately rapid. The available water capacity is low.

This soil responds well to fertilization. Tilth is difficult to maintain because of coarse fragments.

The potential is poor for row crops. Nearly all the acreage is pasture. This soil has fair potential for pasture. The principal pasture crop is common bermudagrass. Other suitable crops are bahiagrass and weeping lovegrass. A shallow root zone and the low available water capacity are major limitations.

The potential is poor for shortleaf pine, loblolly pine, and redcedar. The limited root zone and low available water capacity restrict tree growth.

The potential is poor for most urban uses. Depth to bedrock is a severe limitation that is costly to overcome. Capability unit VIe-1; woodland suitability group 5d2; pasture and hayland group 14A.

19—Mountainburg very stony fine sandy loam, 8 to 12 percent slopes. This shallow, well drained, moderately sloping soil is on ridgetops and hillsides. Areas range from about 40 to 200 acres.

Typically, the surface layer is dark brown very stony fine sandy loam about 5 inches thick. The subsurface layer is strong brown and yellowish brown very stony fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard, massive sandstone bedrock is at a depth of 16 inches.

Included with this soil in mapping are a few small areas of well drained Enders soils and Linker soils. Also included are a few small areas of sandstone bedrock outcrop. These included areas make up about 15 percent of the map unit.

Natural fertility and organic matter content are low. Reaction is medium acid or strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and the hazard of erosion is severe.

The potential is poor for row crops. It is also poor for pasture (fig. 3), because of stones and the low available water capacity. Suitable pasture plants are bahiagrass, common bermudagrass, and weeping lovegrass. Controlled grazing, fertilization, weed and brush control, and stone removal are needed.

Nearly all the acreage is woodland. The potential is poor for shortleaf pine, loblolly pine, and redcedar. A limited root zone and low available water capacity restrict tree growth. Stones are a severe limitation for new seedlings and equipment.

The potential is poor for most urban uses. Slope, depth to bedrock, and stones are limitations that are costly to overcome. Capability unit VIs-1; woodland suitability group 5x3; pasture and hayland group 14C.

20—Mountainburg very stony fine sandy loam, 12 to 40 percent slopes. This shallow, well drained, steep soil is on ledges, shallow ridgetops, and benches. Areas range from 60 to 400 acres.

Typically, the surface layer is dark brown very stony fine sandy loam about 5 inches thick. The subsurface layer is strong brown and yellowish brown very stony fine sandy loam about 6 inches thick. The subsoil is strong brown very stony sandy clay loam about 5 inches thick. Hard, massive sandstone bedrock is at a depth of 16 inches.

Included with this soil in mapping are a few small areas of well drained Enders soils and Linker soils. Also included are a few small areas of sandstone bedrock outcrops. These included areas make up about 15 percent of the map unit.

Natural fertility and organic matter content are low. Reaction is medium acid or very strongly acid in the surface layer and strongly acid or very strongly acid in the subsoil. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and the hazard of erosion is severe.

The potential is poor for row crops. It is also poor for pasture, because of the low available water capacity and stones. Suitable pasture crops are bahiagrass, common bermudagrass, and weeping lovegrass. Controlled grazing, fertilization, weed and brush control, and stone removal are needed.

Most of the acreage is woodland. The potential is poor for shortleaf pine, loblolly pine, and redcedar (fig. 4). A limited root zone and the low available water capacity restrict tree growth. Stones are a severe limitation for equipment and new seedlings.

The potential is poor for most urban uses. Slope, depth to bedrock, and stones, which are the main limitations, are costly to overcome. Capability unit VIIs-1; woodland suitability group 5x3; pasture and hayland group 14B.

21—Muskogee silt loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on high stream terraces. Areas range from about 20 to 160 acres.

Typically, the surface layer is brown silt loam about 1 inch thick. The subsurface layer is pale brown, mottled silt loam about 4 inches thick. The upper 15 inches of the subsoil is yellowish brown, mottled silty clay loam. The next 38 inches is light brownish gray and gray, mottled silty clay. Below this is red, mottled silty clay that extends to 78 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Acadia soils and well drained McKamie soils. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid throughout. Permeability is slow. The available water capacity is high.

The potential is fair for most row crops commonly grown in the county. The main row crops are soybeans, cotton, and small grain.

Most of the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza. The major limitation is a clayey subsoil that restricts roots and the movement of water.

The potential is fair for loblolly pine, shortleaf pine, and eastern redcedar. There are no significant limitations in woodland use and management.

The potential is poor for most urban uses. High shrink-swell potential and low strength are severe limitations for dwellings, streets, and industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

22—Muskogee silty clay loam, 3 to 8 percent slopes, severely eroded. This deep, moderately well drained, gently sloping soil is on high stream terraces. Areas range from about 10 to 200 acres.

Typically, the surface layer is yellowish red silty clay loam about 3 inches thick. Most of the original surface layer has been lost through erosion. The upper 15 inches of the subsoil is yellowish brown, mottled silty clay loam. The next 38 inches is light brownish gray and gray, mottled silty clay. The lower part of the subsoil is red, mottled silty clay that extends to 78 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Acadia soils and well drained McKamie soils. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid throughout. Permeability is slow. The available water capacity is high.

The potential is poor for most row crops commonly grown in the county. Nearly all the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable crops are bahiagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza. The major limitations are a hazard of erosion and a clayey subsoil that restricts roots and movement of water.

The potential is fair for loblolly pine, shortleaf pine, and eastern redcedar. There are no significant limitations in woodland use and management.

The potential is poor for most urban uses. High shrink-swell potential and low strength are severe limitations for dwellings, streets, and industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IVe-1; woodland suitability group 3o7; pasture and hayland group 8A.

23—Ouachita silt loam, occasionally flooded. This deep, level, well drained soil is on flood plains and natural levees along tributaries of the Arkansas River. This soil, which is not protected by levees, is flooded no more than once every 2 years. Slopes are less than 1 percent. Areas range from about 20 to 200 acres.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsurface layer is brown, mottled silt loam about 7 inches thick. The upper 47 inches of the subsoil is dark yellowish brown, mottled silt loam. The lower part is mottled yellowish brown, gray, and brown silt loam that extends to 76 inches or more.

Included with this soil in mapping are a few small areas of the poorly drained Amy soils and the well drained Spadra soils. Also included are small low areas that are flooded for short periods at least once every 2 years. These included areas make up about 10 percent of this map unit.

Natural fertility is moderate. Organic matter content is low. Unless the surface layer has been limed, reaction is strongly or very strongly acid throughout. Permeability is moderately slow. The available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most crops commonly grown in the county. Most of the acreage is cropland. The principal crop is soybeans. Among the other suitable crops are corn and small grain. This soil has good potential for pasture. Bahiagrass, common bermudagrass (fig. 5), tall fescue, white clover, sericea lespedeza, and annual lespedeza are suitable pasture crops.

The potential is good for loblolly pine, sweetgum, and eastern cottonwood. Occasional flooding is the main limitation in woodland use and management.

The potential is poor for most urban uses. Flooding is a severe limitation and can be overcome only by major flood control measures. Capability unit IIw-1; woodland suitability group 1w8; pasture and hayland group 2A.

24—Perry clay, occasionally flooded. This deep, poorly drained, level soil is in low back swamps along the Arkansas River and its tributaries. This soil, which is not protected by levees, is flooded no more than once every 2 years. Slopes are less than 1 percent. Areas range from 30 to 500 acres.

Typically, the surface layer is dark grayish brown, mottled clay about 9 inches thick. The upper 10 inches of the subsoil is dark gray, mottled clay. The next 10 inches is gray, mottled clay. Below this is 15 inches of reddish brown clay. The underlying material is reddish brown, mottled clay that extends to 67 inches or more.

Included in mapping are a few small areas of somewhat poorly drained Moreland soils, areas where the upper part of the subsoil is less acid, and areas where the surface layer is dark. Also included are small low swales that are flooded at least once every 2 years. These included areas make up about 15 percent of this map unit.

Natural fertility is moderate. Organic matter content is low. Unless the surface layer has been limed, reaction in the surface layer and upper part of the subsoil ranges from medium acid to strongly acid. The lower part of the subsoil and the underlying material are mildly alkaline or moderately alkaline. Permeability is very slow. Available water capacity is high. This soil responds well to fertilization.

The potential is good for rice and soybeans but low for other crops commonly grown in the county. Most of the acreage is cultivated. The principal crops are rice and soybeans. Other crops are grain sorghum and pasture or hay grasses. The potential is higher for short season crops than for long season crops. Because of the high clay content, this soil can be cultivated within only a narrow range of moisture content. Preparing a seedbed and maintaining good tilth are difficult. Unless surface drainage is provided, fieldwork is delayed several days after a rain. This soil has good potential for pasture. Suitable pasture crops are bermudagrass, tall fescue, white clover, and bahiagrass.

The potential is good for eastern cottonwood, sweetgum, and green ash. Wetness and flooding limit the use of equipment and the harvest of the tree crop. This limitation can be overcome by using special equipment and by logging during the drier seasons.

The potential is poor for urban uses. Wetness, flooding, and high shrink-swell potential, the main limitations, can be overcome only by major flood control, drainage measures, and special engineering designs. Capability unit IVw-1; woodland suitability group 2w6; pasture and hayland group 1A.

25—Pickwick silt loam, 1 to 3 percent slopes. This deep, nearly level, well drained soil is on stream terraces. Acres range from about 25 to 120 acres.

Typically, the surface layer is strong brown silt loam about 4 inches thick. The upper 28 inches of the subsoil is yellowish red silty clay loam. Below this is yellowish red and red, mottled clay loam that extends to 67 inches or more.

Included in mapping are a few small areas of the moderately well drained Leadvale soils, well drained Spadra soils, and somewhat poorly drained Taft soils. These included areas make up about 10 percent of this unit.

Natural fertility is moderate. Organic matter content is low. Unless the surface has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most row crops commonly grown in the county. The principal cultivated crop is soybeans. Other suitable crops are cotton, corn, and small grain. This soil has fair to good potential for pasture. Suitable pasture crops are bahiagrass, bermudagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is good for shortleaf pine, black walnut, and loblolly pine. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Low strength, the main limitation for dwellings, streets, and industrial sites, can be overcome by proper engineering and design. There are no limitations for septic tank absorption fields. Capability unit IIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

26—Pickwick silt loam, 3 to 8 percent slopes, eroded. This deep, gently sloping, well drained soil is on stream terraces. Areas range from about 40 to 200 acres.

Typically, the surface layer is brown silt loam about 3 inches thick. Some of the original surface layer has been lost through erosion. The present layer is a mixture of the original surface layer and subsoil material. The upper 28 inches of the subsoil is yellowish red silty clay loam. Below this is yellowish red and red, mottled clay loam that extends to 67 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Leadvale soils, well drained Spadra soils, and somewhat poorly drained Taft soils. These included areas make up about 10 percent of this map unit.

Natural fertility is moderate. Organic matter content is low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is high.

This soil responds well to fertilization and is easy to keep in good tilth. Erosion is a severe hazard.

The potential is fair for most well managed crops commonly grown in the county. The principal cultivated crop is soybeans. Other suitable crops are cotton, corn, and small grain. This soil has fair to good potential for pasture. Suitable pasture crops are bahiagrass, bermudagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is good for shortleaf pine, black walnut, and loblolly pine. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Low strength, the main limitation for dwellings, streets, and industrial sites, can be overcome by proper engineering design. There are no limitations for septic tank absorption fields. Capability unit IIIe-1; woodland suitability group 3o7; pasture and hayland group 8A.

27—Roxana very fine sandy loam. This deep, well drained, level to nearly level soil is on flood plains along the Arkansas River. Levees protect it from flooding. The slope is 0 to 2 percent. Areas range from 50 to 500 acres.

Typically, the surface layer is dark yellowish brown very fine sandy loam about 6 inches thick. The underlying material is stratified brown, strong brown, and yellowish red very fine sandy loam to a depth of 75 inches or more.

Included with this soil in mapping are a few small areas of well drained Gallion soils and areas that are flooded occasionally for short periods. These included areas make up about 10 percent of the map unit.

Natural fertility is high. The organic matter content is low. Reaction is neutral or slightly acid in the surface layer and neutral to moderately alkaline in the underlying material. Permeability is moderate. Available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most crops commonly grown in the county. Nearly all the acreage is cultivated. The principal crops are soybeans and cotton. Corn, small grain, and truck crops are also grown. This soil has good potential for pasture. Suitable pasture plants are bermudagrass, bahiagrass, tall fescue, white clover, and annual lespedeza.

The potential is good for eastern cottonwood, sweetgum, and American sycamore. There are no significant limitations in woodland use or management.

The potential is good for most urban uses. Low strength, affecting roads and streets, and wetness, affecting basements, are the main limitations. These limitations can be overcome by proper engineering design. Capability unit I-1; woodland suitability group 1o4; pasture and hayland group 2A.

28—Roxana very fine sandy loam, occasionally flooded. This deep, well drained, level to nearly level soil is on flood plains along the Arkansas River. It is not protected by levees but is flooded no more than once every 2 years. Slopes are 0 to 2 percent. Areas range from 40 to 250 acres.

Typically, the surface layer is dark yellowish brown very fine sandy loam about 6 inches thick. The underlying material is stratified brown, strong brown, and yellowish red very fine sandy loam that extends to 75 inches or more.

Included with this soil in mapping are a few small areas of the well drained Gallion soils and areas where the texture is fine sand to a depth of 40 inches or more. Also included are small low areas that are flooded for short periods every 2 years. These included areas make up about 10 percent of this map unit.

Natural fertility is high. Organic matter content is low. Reaction is neutral or slightly acid in the surface layer and neutral to moderately alkaline in the underlying material. Permeability is moderate. Available water capacity is high.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most crops commonly grown in the county. Nearly all the acreage is cultivated. The principal crops are cotton and soybeans. Other crops are corn and small grain. Flooding sometimes delays planting. This soil has good potential for pasture. Suitable pasture plants are bermudagrass, bahiagrass, tall fescue, white clover, and annual lespedeza.

The potential is good for eastern cottonwood, sweetgum, and American sycamore. There are no significant limitations in woodland use or managemet.

The potential is poor for most urban uses. Flooding, the main limitation, can be overcome only by major flood control measures. Capability unit IIw-1; woodland suitability group 1o4; pasture and hayland group 2A.

29—Sallisaw gravelly sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on high terraces near the Arkansas River. Areas range from about 20 to 80 acres.

Typically, the surface layer is yellowish brown gravelly sandy loam about 5 inches thick. The upper 7 inches of the subsoil is strong brown, mottled gravelly sandy loam. Below this is red, mottled gravelly sandy clay loam that extends to 72 inches or more.

Included with this soil in mapping are a few small areas of well drained McKamie soils and moderately well drained Muskogee soils. These included areas make up about 10 percent of the unit.

Natural fertility and organic matter content are low. Permeability is moderate, and available water capacity is medium. Unless the surface layer has been limed, reaction is slightly acid or medium acid. The subsoil is strongly acid or very strongly acid.

This soil responds well to fertilization. Tilth is difficult to maintain because of the gravel content. Erosion is a moderate hazard.

The potential is fair for most well managed row crops commonly grown in the county. Most of the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is fair for shortleaf pine, loblolly pine, and black walnut. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Low strength is the main limitaion for streets, dwellings, and industrial sites. Slope is a slight limitation for septic tank absorption fields. These limitations can be overcome by proper engineering design. Capability unit IIIe-2; woodland suitability group 3o7; pasture and hayland group 8A.

30—Sallisaw gravelly sandy loam, 8 to 12 percent slopes. This deep, well drained, gently sloping soil is on high terraces near the Arkansas River. Areas range from about 80 to 400 acres.

Typically, the surface layer is yellowish brown gravelly sandy loam about 5 inches thick. The upper 7 inches of the subsoil is strong brown, mottled gravelly sandy loam. Below this is red, mottled gravelly sandy clay loam that extends to 72 inches or more.

Included with this soil in mapping are a few small areas of well drained McKamie soils and moderately well drained Muskogee soils. These included areas make up about 10 percent of the unit.

Natural fertility and organic matter content are low. Permeability is moderate, and available water capacity is medium. Unless the surface layer has been limed, it is slightly acid or medium acid. The subsoil is strongly acid or very strongly acid.

This soil responds well to fertilization. Tilth is difficult to maintain because of the gravel content. Erosion is a severe hazard.

The potential is poor for most cultivated crops commonly grown in the county. Most of the acreage is pasture. This soil has fair to good potential for pasture. The principal pasture crop is common bermudagrass. Other suitable pasture crops are bahiagrass, tall fescue, white clover, sericea lespedeza, and annual lespedeza.

The potential is fair for shortleaf pine, loblolly pine, and black walnut. There are no significant limitations in woodland use or management.

The potential is fair for most urban uses. Low strength and slope are the main limitations for streets, dwellings, and industrial sites. Slope is a moderate limitation for septic tank absorption fields. These limitations can be overcome by proper engineering design. Capability unit IVe-2; woodland suitability group 3o7; pasture and hayland group 8A.

31—Spadra fine sandy loam, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on stream terraces. Areas range from about 20 to 300 acres.

Typically, the surface layer is brown fine sandy loam about 7 inches thick. The upper 6 inches of the subsoil is dark yellowish brown loam. The middle 17 inches is reddish brown loam. The lower 14 inches is reddish brown sandy clay loam. The underlying material is reddish brown loam that extends to 73 inches or more.

Included with this soil in mapping are a few small areas of poorly drained Amy soils and well drained Ouachita soils. Also included are small low areas that are flooded for short periods no more than once every 2 years. These included areas make up about 10 percent of the map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very stongly acid throughout. Permeability is moderate. Available water capacity is high. Runoff is slow.

This soil responds well to fertilization. It is easy to keep in good tilth.

The potential is good for most cultivated crops commonly grown in the county. Most of the acreage is cropland. The principal crop is soybeans. Other crops are corn and small grain. This soil has good potential for pasture. Suitable pasture crops are common bermudagrass, tall fescue, bahiagrass, white clover, sericea lespedeza, and annual lespedeza.

The potential is good for loblolly pine, shortleaf pine, and black walnut. There are no major limitations in woodland use or management.

The potential is good for most urban uses. Low strength, the main limitation for roads and streets, can be overcome with proper engineering design. Capability unit IIe-1; woodland suitability group 2o7; pasture and hayland group 8A.

32—Taft silt loam, 0 to 2 percent slopes. This deep, nearly level, somewhat poorly drained soil is on stream terraces and in depressions. Areas range from about 50 to 300 acres.

Typically, the surface layer is dark grayish brown silt loam about 1 inch thick. The subsurface layer is light olive brown, mottled silt loam about 5 inches thick. The upper 18 inches of the subsoil is pale brown and light yellowish brown, mottled silt loam and silty clay loam. The next 18 inches is mottled yellowish brown and gray silty clay loam. It is compact and brittle. Below this is mottled gray and yellowish brown silty clay loam that extends to 76 inches or more.

Included with this soil in mapping are a few small areas of poorly drained Amy soils, moderately well drained Leadvale soils, and well drained Pickwick soils. Also included are a few low mounds. These included areas make up about 10 percent of this map unit.

Natural fertility and organic matter content are low. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium.

The subsoil has a compact layer that restricts roots and movement of water. The seasonally high water table is within 24 inches of the surface duing winter and early in spring. The soil responds well to fertilization, and is easy to keep in good tilth.

The potential is fair for most cultivated crops commonly grown in the county. The principal cultivated crop is soybeans. Other suitable crops are cotton and small grain. This soil has good potential for pasture. Suitable pasture crops are bermudagrass, tall fescue, bahiagrass, sericea lespedeza, white clover, and annual lespedeza. The main limitation is wetness. A compact layer 20 to 36 inches below the surface restricts root penetration and movement of water.

The potential is fair for shortleaf pine, sweetgum, and loblolly pine. Wetness, a moderate limitation in woodland use and management, can be overcome by logging during the drier seasons.

The potential is poor for most urban uses. Wetness and a seasonal high water table are severe limitations for dwellings, streets, and industrial sites. The slow permeability and seasonal high water table are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIIw-1; woodland suitability group 3w8; pasture and hayland group 8F.

33—Yorktown silty clay. This deep, very poorly drained, level soil is on an inundated back swamp of Palarm Creek along the southern boundary of the county. It is covered with 24 to 60 inches of water at least 10 months of each year. The slope is 0 to 1 percent. The area, known as Clear Lake, is 1,636 acres.

Typically, the surface layer is dark gray, mottled silty clay about 3 inches thick. The upper 14 inches of the subsoil is gray, mottled clay. The next 33 inches is gray and dark gray, mottled clay. Below this is dark reddish brown, mottled clay that extends to 60 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Moreland soils and poorly drained Perry soils. Also included are a few areas that are inundated for less than 10 months each year.

Natural fertility is moderate. Organic matter content is medium. The surface layer is medium acid to neutral. Reaction in the upper part and middle part of the subsoil ranges from neutral to medium acid. The lower part of the subsoil is mildly alkaline and calcareous. Permeability is very slow. Available water capacity is high.

The potential is poor for most crops commonly grown in the county. All of the acreage is in scattered forest vegetation. The soil is not suited to cultivated crops because it is inundated at least 10 months each year.

The potential is fair for baldcypress, green ash, and water tupelo. Wetness and inundation severely limit the use of equipment in managing and harvesting the tree crop. This can be overcome only with special equipment during the drier seasons.

The potential is poor for urban ues. Wetness, inundation, and high shrink-swell potential, the main limitations, prohibit urban development. Capability unit VIIw-1; woodland suitability group 4w9; not assigned to a pasture and hayland group.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, rangeland, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

W. WILSON FERGUSON, agronomist, Soil Conservation Service, helped prepare this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

More than 200,000 acres in the survey area was cropland and pasture in 1967 (7). Of this total, 138,467 acres was permanent pasture and 61,538 acres row crops, mainly soybeans.

The potential is good for increased production of food. About 20,000 acres of potentially good cropland is currently woodland and about 50,000 acres is pasture. In addition to the reserve productive capacity represented by this land, food production can also be increased by applying the latest technology to all cropland in the county. This publication can greatly facilitate the application of such technology.

The acreage in crops and pasture has gradually decreased as more and more land is used for urban development. In 1967, an estimated 16,000 acres in the county was urban and built-up land. Since that date, this figure has increased at the rate of about 2,000 acres per year. Land use decisions that will influence the future role of farming in the county are considered under the heading "General soil map for broad land use planning."

Soil erosion is a major problem on cropland and pasture in Faulkner County. If the slope is more than 2 percent, erosion is a hazard. Enders, Linker, Mountainburg, Pickwick, and Sallisaw soils, for example, have slopes of more than 2 percent.

Loss of the surface layer through erosion is damaging for two reasons: (1) Productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils with a clayey subsoil, for example, Enders, McKamie, and Muskogee soils. It is also damaging on soils with a layer in or below the subsoil that limits the depth of the root zone. The fragipan in Leadvale and Taft soils and the bedrock underlying Linker and Mountainburg soils are examples. Erosion also reduces productivity on soils that tend to be droughty, such as Mountainburg soils. (2) Erosion on farmland results in sediment entering streams. Erosion control minimizes the pollution of streams by sediment. It also improves the quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, preparing a good seedbed and tilling are difficult on clayey or hardpan spots because the original friable surface soil has been eroded away. Such spots are common in areas of moderately eroded McKamie and Muskogee soils.

Erosion control provides a protective surface cover, reduces runoff, and increases infiltration. A cropping system that keeps a plant cover on the soil for extended periods can limit the loss of soil through erosion to an amount that does not reduce the productive capacity of the soil. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system not only reduce the hazard of erosion on sloping land but also provide nitrogen and improve tilth for the following crop.

Contour tillage or terracing is not practical on some soils. Unless tillage is kept to a minimum on these soils, a cropping system that provides a substantial plant cover is needed. Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area but are less successful on eroded soils and on soils that have a clayey surface layer, such as Moreland and Perry soils. Terraces and diversions, which reduce the length of the slope, reduce runoff and the erosion hazard. They are most suitable on deep, well drained or moderately well drained soils with regular slopes, such as Leadvale, Muskogee, and Pickwick soils. Terraces and diversions would be less suitable on other soils because of irregular slopes, excessive wetness in terrace channels, a clayey subsoil exposed in the terrace channels, or bedrock within a depth of 20 inches.

Information on the design of erosion control practices for each kind of soil is in the Technical Guide available at local offices of the Soil Conservation Service.

Soil drainage is the major management need on some of the cropland and pasture in the survey area. Examples are the poorly drained Amy and Perry soils and the somewhat poorly drained Acadia, Moreland, and Taft soils.

Enders and McKamie soils have good natural drainage most of the year, but they tend to dry out slowly after rains. Small areas of wetter soils along drainageways and in swales are commonly included in areas of the moderately well drained Leadvale and Muskogee soils, especially where the slope is more than 2 percent. Artificial drainage is needed in some of these wetter areas.

Information on drainage design for each kind of soil is in the Technical Guide available at local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils of the uplands in the survey area. The soils on flood plains, such as Gallion and Roxana soils, both of which range from medium acid to neutral, are naturally higher in plant nutrients than most upland soils.

Many upland soils are naturally very strongly acid. If they have never been limed, they require applications of ground limestone to raise the pH level sufficiently for good growth of crops or pasture. Available phosphorus and potash levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils in good tilth are granular and porous.

Most of the soils used for crops in the survey area have a silt loam surface layer that is light in color and low in content of organic matter. Generally the structure of such soils is weak, and intense rainfall causes the formation of a crust on the surface. The crust is hard when dry and impervious to water. It reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material improve soil structure and reduce crust formation.

In this county fall plowing is generally not a good practice on the light colored soils that have a silt loam surface layer because of the crust that forms during the winter and spring. Many of those soils are nearly as dense and hard at planting time after fall plowing as they were before they were plowed. Also, some cropland consists of sloping soils that are subject to damaging erosion if they are plowed in the fall.

Because the dark colored Moreland and Perry soils are clayey, tilth is a problem. These soils often stay wet until

late in spring. If they are plowed when wet, they tend to be very cloddy when dry. Thus, seedbeds are difficult to prepare. Fall plowing generally results in good tilth in spring.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Cotton, corn, sunflowers, spinach, peanuts, potatoes, and similar crops can be grown.

Soybeans and, to an increasing extent, rice are the row crops commonly grown, along with grain sorghum. Wheat and oats are the close-growing crops. Seed is produced from bahiagrass, fescue, rye, and clover.

Pasture and hayland acreages are increased each year by converting cropland to permanent grassland. In addition, some woodland is cleared each year for forage crops.

Coastal bermudagrass, common bermudagrass, and Pensacola bahiagrass are the summer perennials most commonly grown. Coastal bermudagrass and Pensacola bahiagrass are fairly new to the county, but both are highly satisfactory in production of good quality forage. Johnsongrass also is suited to many of the soils. Tall fescue is the principal winter perennial grass. Annual lespedeza and white clover, the most commonly used legumes, are usually grown in combination with grass. Alfalfa is grown on the fertile, well drained soils on bottomland adjacent to the Arkansas River.

Proper grazing is essential for the production of high quality forage and for stand survival and erosion control. Maintaining sufficient top growth on the plants during the growing season provides vigorous healthy growth. Grazing of tall fescue should be restricted in summer. Brush control is essential. Weed control is often needed.

Grass pasture responds well to nitrogen fertilizer. Grass and legume mixtures may require phosphate and potash fertilizers and lime, at rates based on the results of soil tests.

Rotation grazing and renovation are also important in good pasture and hay management.

The soils of Faulkner County have been placed in eleven pasture and hayland groups. These groups have been prepared to assist land users in the selection and management of suitable forage plants. The soils included in each group support similar kinds of forage plants and require similar treatment and management. Forage production for one soil in the group is essentially the same as production for other soils in the group when management and treatment are the same. The pasture and hayland groups are identified in the description of each soil map unit in the section, "Soil maps for detailed planning." Additional information can be found in the Technical Guide available in the local office of the Soil Conservation Service.

Special crops grown commercially in the survey area are vegetables, small fruits, tree fruits, and nursery plants. A small acreage throughout the county is used for melons, strawberries, sweet corn, tomatoes, and other vegetables and small fruits. In addition, large areas can be adapted to other special crops such as boysenberries, grapes, and many vegetables. Apples are the most important tree fruit in the county.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. Examples in the survey area are Gallion, Ouachita, Pickwick, Sallisaw, and Spadra soils, all of which have slopes of less than 6 percent. They total about 20,000 acres. If irrigated, about 12,000 acres of Linker soils would be suited to vegetables and small fruits. Crops can generally be planted and harvested earlier on all these soils than on other soils in the survey area.

If adequately drained, the moderately well drained soils in the county would be well suited to a wide range of vegetable crops. Examples are Leadvale and Muskogee soils, which make up about 86,000 acres in the survey area.

Most of he well drained soils in the survey area are suitable for orchards and nursery plants. Soils in low positions, however, where air drainage is poor and frost is frequent, generally are poorly suited to early vegetables, small fruits, and orchards.

The latest information and suggestions on growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 7.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for

each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown; that good quality irrigation water is uniformly applied in proper amounts as needed; and that tillage is kept to a minimum. The only irrigated crop in this county is rice. Some crops, such as spinach, may receive supplemental irrigation water.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability unit is identified in the description of each soil map unit in the section "Soil maps for detailed planning." Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

Woodland management and productivity

JAMES T. BEENE, forester, Soil Conservation Service, helped prepare this section.

All of Faulkner County except the river sandbars was originally wooded. Within the upland forests were scattered tracts of savanna where open stands of trees had an understory of tall native grasses. In 1967, about 40 percent of the county was woodland (7). Since that time, urban development and pasture and hayland expansion have reduced the acreage of woodland.

Poor to fair stands of woodland are on ridges. Good stands are in valleys and on flood plains. Needleleaf forest types grow most commonly on the uplands. Broadleaf types are predominant on the flood plains.

The value of wood products is significant, but below its potential. Woodland also provides grazing, wildlife, recreation, natural beauty, and conservation of soil and water. This section explains how soils affect tree growth and management in the county.

Table 8 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Mapping unit symbols for soils suitable for wood crops are listed, and the woodland suitability group for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *woodland suitability group*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

In table 8 the soils are also rated for a number of factors to be considered in management. *Slight*, *moderate*, and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. In Faulkner County this period is 30 years for eastern cottonwood and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Rangeland

DARWIN C. HEDGES, range conservationist, Soil Conservation Service, helped prepare this section.

About 5 percent, or 19,479 acres, of Faulkner County is rangeland (*7*). Most of the agricultural income from this rangeland is derived from cattle, principally cow-calf enterprises.

Rangeland forage is usually supplemented with protein when the range is grazed during the dormant season. Creep feeding calves to increase market weight is done on some farms.

The native vegetation on much of the range has been somewhat depleted by overgrazing. Much of this acreage is now covered with brush and weeds. Effective range management can increase the important forage producing climax grasses, particularly little bluestem and big bluestem.

Where climate and topography are about the same, differences in the kind and amount of vegetation that rangeland can produce are related closely to the kind of soil. Effective management is based on the relationships among soils, vegetation, and water.

Table 9 shows, for each kind of soil, the name of the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; and the characteristic vegetation. Soils not listed cannot support a natural plant community of predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. The following are explanations of column headings in table 9.

A *range site* is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. Soils that produce a similar kind, amount, and proportion of range plants are grouped into range sites. For those areas where the relationship between soils and vegetation has been established, range sites can be interpreted directly from the soil map. Properties that determine the capacity of the soil to supply moisture and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total production refers to the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year the amount and distribution of precipitation and the temperatures are such that growing conditions are substantially better than average; in a normal year these conditions are about average for the area;

in an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight refers to the total air-dry vegetation produced per acre each year by the potential natural plant community. Vegetation that is highly palatable to livestock and vegetation that is unpalatable are included. Some of the vegetation can also be grazed extensively by wildlife.

Characteristic species of grasses, grasslike plants, forbs, and shrubs that make up most of the potential natural plant community on each soil are listed by common name. The amount that can be used as forage depends on the total production, on the kinds of grazing animals, and on the grazing season. Generally all of the vegetation produced is not used.

Range management requires, in addition to knowledge of the kinds of soil and the potential natural plant community, an evaluation of the present condition of the range vegetation in relation to its potential. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the maximum production of vegetation, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

The major management concern is control of grazing so that the kinds and amounts of plants that make up the potential plant community are reestablished. Controlling weeds and brush is also important. If sound range management based on the soil survey information and rangeland inventories is applied, the potential is good for increasing the productivity of range in the county.

Engineering

JAMES L. JANSKI, civil engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 10 shows, for each kind of soil, the degree and kind of limitations for building site development; table 11 for sanitary facilities; and table 12, for water management. Table 13 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 10. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, and open ditches. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 10 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 10 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 11 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 11 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 13 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 13 provide guidance as to where to look for probable sources and are

based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 12 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of Faulkner County are rated in table 15 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, ac-

cess to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 15 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 11, and interpretations for dwellings without basements and for local roads and streets, given in table 10.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Wildlife habitat

Roy A Grizzell, Jr., biologist, Soil Conservation Service, helped prepare this section.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 16, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture

of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, or foliage used by wildlife or that provide cover and shade for some species of wildlife. Major soil properties that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and moisture. Examples of shrubs are mountain-mahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, and cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering properties

JAMES L. JANSKI, civil engineer, Soil Conservation Service, helped prepare this section.

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

The estimated classification is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In this survey, many of the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 17 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Salinity is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of the nonirrigated soils. The salinity of individual irrigated fields is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of individual fields can differ greatly from the value given in table 17. Salinity affects the suitability of a soil for crop production, its stability when used as a construction material, and its potential to corrode metal and concrete.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 18 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between gray-

ish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Cemented pans are hard subsurface layers, within a depth of 5 or 6 feet, that are strongly compacted (indurated). Such pans cause difficulty in excavation. The hardness of pans is similar to that of bedrock. A rippable pan can be excavated, but a hard pan generally requires blasting.

Physical and chemical analyses of selected soils

The results of physical analysis of several typical pedons of the survey area are given in table 19. The results of chemical analyses of these soils are given in table 20. The data presented are for samples from soil series that are important in the survey area. All samples were collected from carefully selected sites that are typical of the series and discussed in the section "Soil series and morphology." The soil samples were analyzed by the University of Arkansas in Fayetteville.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. All capacity measurements are reported on an oven-dry basis. The methods that were used in obtaining the data are indicated in the list that follows. The codes, in parentheses, refer to published methods codes (*8*).

Silt and clay particle size distribution was determined by the hydrometer method (*3*).
Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).
Organic carbon—dichromate, ferric sulfate titration (6A1a).
Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (6O2), sodium (6P2), potassium (6Q2).
Extractable acidity—barium chloride-triethanolamine I (6H1a).
Cation-exchange capacity—sum of cations (5A3a).
Reaction (pH)—1:1 water dilution (8C1a).
Soluble ions—flame photometry; sodium (6P1a), potassium (6Q1a).
Soluble ions—atomic absorption; calcium (6N1b), magnesium (6O1b).
Available phosphorus— extracted with the Bray No. 1 solution (0.03 *N*(ammonium fluoride in 0.025 *N* hydrochlorie acid) and measured colorimetrically.

Mineralogy of selected soils

The amount and kind of weatherable minerals in the control section of a soil is an important indicator of the natural productivity of the soil. Samples of the Ouachita soil were tested by chemical analysis, X-ray diffraction, and other analytical techniques according to standard procedures (*4*, *5*). The results of these tests are listed in table 21.

The family placement of the Ouachita soils is based on the sand mineralogy fraction (0.02-2.0 mm). The dominant mineral is quartz which is considered a non-weatherable mineral. The sand mineralogy and family placement are siliceous.

The clay mineralogy of soils is an important factor in engineering uses as clay influences the retention and movement of water and the stability of soils for foundation material. The clay mineralogy is based on the fraction of soil material less than 0.002 millimeters in diameter. The clay mineralogy of the Quachita soil is equal amounts of vermiculite-chlorite, mica, and kaolinite with no single mineral making up 40 percent of the total. The clay mineralogy is mixed.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*6*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or mapping units, of each soil series are described in the section "Soil maps for detailed planning."

Acadia series

The Acadia series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium on stream terraces in the Arkansas Valley. These soils are saturated with water late in winter and early in spring. The native vegetation was mixed hardwoods. Slopes are dominantly less than 2 percent.

The Acadia soils in this survey area are geographically associated with McKamie, Muskogee, and Moreland soils. McKamie soils, which are on higher terraces than the Acadia soils, are well drained. Muskogee soils, which are also on higher terraces, are moderately well drained. Moreland soils, which are in adjacent back swamps in the bottom land, are clayey throughout.

Typical pedon of Acadia silt loam in wooded area NW1/4NW1/4SE1/4 sec. 36, T. 4 N., R. 14 W.:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; many fine distinct pale brown (10YR 6/3) mottles; moderate medium granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—4 to 12 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B1—12 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

B21tg—18 to 34 inches; gray (10YR 6/1) silty clay; mottles are few fine prominent yellowish red (5YR 5/8), few fine distinct light yellowish brown (10YR 6/4), and common medium distinct strong brown (7.5YR 5/6); moderate medium subangular blocky structure; firm; common patchy clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B22tg—34 to 54 inches; gray (10YR 6/1) silty clay; mottles are common medium distinct strong brown (7.5YR 5/6) and few fine faint light yellowish brown (10YR 6/4) and yellowish red (5YR 5/6); weak medium subangular blocky structure; firm, plastic; few fine roots; few fine pores; common, continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—54 to 78 inches; gray (10YR 6/1) clay; common medium prominent yellowish red (5YR 5/8) mottles; massive; very firm; slightly acid.

Solum thickness ranges from 40 to 60 inches. Unless the surface layer has been limed, reaction of the A horizon is medium acid to very strongly acid. The B horizon is strongly acid or very strongly acid, and the C horizon is mildly alkaline to very strongly acid.

Thickness of the A horizon ranges from 10 to 20 inches. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 6. It is silt loam or light silty clay loam. The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is silty clay or clay. Mottles are in shades of brown and yellow, are few or common, and are fine or medium.

The Cg and B2 horizons have similar ranges of color and texture.

Amy series

The Amy series consists of deep, poorly drained, slowly permeable soils that formed in loamy alluvium on flood plains. These soils are saturated with water late in winter and early in spring. The native vegetation was mixed hardwoods. Slopes are dominantly less than 1 percent.

The Amy soils in this survey area are geographically associated with Leadvale, Ouachita, Spadra, and Taft soils. Leadvale soils, which are on nearly level and gently sloping terraces, have a fragipan. Ouachita soils, which are on higher flood plains than Amy soils, have a cambic horizon and are well drained. Spadra soils which are on stream terraces, are well drained. Taft soils which are on terraces, have a fragipan.

Typical pedon of Amy silt loam, from an area of Amy soils, frequently flooded, in wooded area SE1/4SW1/4NE1/4 sec. 13, T. 5 N., R. 11 W.:

A1—0 to 6 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

A2g—6 to 12 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

B21tg—12 to 18 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films in pores and on faces of peds; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

B22tg—18 to 40 inches; light gray (10YR 7/1) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common patchy clay films on faces of peds; few fine roots; few fine black accretions; very strongly acid; gradual wavy boundary.

Cg—40 to 60 inches; gray (10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; massive; firm; very strongly acid.

Solum thickness ranges from 40 to 70 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 10 to 20 inches. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 6, and chroma of 1 or 2.

The B horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Mottles are in shades of brown and gray and are few or common. Texture is silt loam or silty clay loam.

The C and B horizons have similar ranges of color and texture.

Enders series

The Enders series consists of deep, well drained, very slowly permeable soils that formed in clayey residuum from shale or interbedded shale and sandstone. These soils are on crests and side slopes of dissected plateaus and ridges. The native vegetation was post oak, red oak, white oak, hickory, and shortleaf pine. Slopes are 3 to 45 percent.

The Enders soils in this survey area are geographically associated with Leadvale, Linker, and Mountainburg soils. Leadvale soils, which are on terraces, have a fragipan. Linker soils, which are on benches and mountaintops, have less clay in the B horizon than Enders soils and are moderately deep over bedrock. The Mountainburg soils, which are on higher mountaintops and ledges, are shallow over bedrock.

Typical pedon of Enders gravelly fine sandy loam, 12 to 45 percent slopes, in pasture SE1/4NE1/4SE1/4 sec. 34, T. 4 N., R. 12 W.:

A1—0 to 3 inches; brown (10YR 4/3) gravelly fine sandy loam; weak fine granular structure; very friable; many fine roots; 20 percent by volume angular fragments of sandstone 1/4 to 1 inch in diameter; few fragments of sandstone 1 to 6 inches in diameter on the surface; strongly acid; abrupt smooth boundary.

B1—3 to 8 inches; strong brown (7.5YR 5/8) gravelly loam; weak fine subangular blocky structure; friable; many fine roots; 15 percent by volume angular fragments of sandstone 1/4 to 1/2 inch in diameter; very strongly acid; gradual wavy boundary.

B21t—8 to 32 inches; yellowish red (5YR 4/6) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; few fine roots and pores; few fragments of sandstone 1/4 to 1 inch in diameter; very strongly acid; gradual wavy boundary.

B22t—32 to 56 inches; red (2.5YR 4/8) clay; common medium prominent yellowish brown (10YR 5/8) and gray (10YR 6/1) mottles; strong coarse subangular blocky structure; very firm; common continuous clay films on faces of peds; 12 percent by volume fragments of shale; very strongly acid; gradual wavy boundary.

Cr—56 to 86 inches; variegated gray (10YR 6/1), red (2.5YR 4/8), and black (10YR 2/1) relict fragments of weathered shale; platy rock structure; distance between vertical cracks is less than 4 inches; fragments of shale can be easily crushed and cut with a spade; very strongly acid.

Solum thickness ranges from 32 to 59 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 2 to 7 inches but is dominantly less than 6 inches. The A1 horizon has hue of 10YR, value of 4 and chroma of 3 or value of 5 and chroma of 3 or 4. Gravel size coarse fragments range from 15 to 30 percent by volume.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 4 to 8. It is gravelly loam, gravelly clay loam, or gravelly silty clay loam. Gravel size coarse fragments range from 15 to 30 percent by volume.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is silty clay loam, silty clay, or clay. Mottles in the lower part of the B2t horizon are few to common, fine or medium, and in shades of yellow, brown, and gray.

Gallion series

The Gallion series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium on level natural levees and low terraces along the Arkansas River. The native vegetation was mixed hardwoods. Slopes are dominantly less than 1 percent.

The Gallion soils in this survey area are geographically associated with Moreland, Perry, and Roxana soils. Moreland soils, which are in back swamps, have a fine textured control section. Perry soils, which are in low back swamps, have a very fine textured control section. Roxana soils, which are on flood plains, have a coarse silty control section.

Typical pedon of Gallion silt loam in moist cultivated area SW1/4SE1/4NE1/4 sec. 30, T. 5 N., R. 14 W.:

A1—0 to 8 inches; brown (7.5YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; many fine pores; medium acid; abrupt smooth boundary.

B21t—8 to 21 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; discontinuous clay films on faces of peds and in root channels; many fine pores; common fine roots; slightly acid; gradual smooth boundary.

B22t—21 to 38 inches; reddish brown (5YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; many continuous clay films on faces of peds; few fine roots; many fine pores; neutral; clear smooth boundary.

B31—38 to 50 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few thin patchy clay films in pores; few fine roots; neutral; clear smooth boundary.

B32—50 to 64 inches; dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; few thin patchy clay films in pores; moderately alkaline; clear wavy boundary.

C1—64 to 81 inches; reddish brown (5YR 4/4) very fine sandy loam; weak medium subangular blocky structure; very friable; many fine pores; moderately alkaline.

Solum thickness ranges from 40 to 64 inches. Reaction ranges from medium acid to neutral in the A horizon, medium acid to mildly alkaline in the B2t, and slightly acid to moderately alkaline in the B3 and C horizons.

Thickness of the A horizon ranges from 6 to 12 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3; value of 5 and chroma of 3; or hue of 7.5YR, value of 4, and chroma of 2.

The B2t horizon has hue of 5YR, value of 3 to 5, and chroma of 3 to 6, or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. It is silt loam or silty clay loam. The B3 and B2t horizons have similar ranges of color and texture.

The C and B horizon have similar ranges of color. In places, the C horizon is stratified.

Leadvale series

The Leadvale series consists of deep, moderately well drained soils that have moderately slow permeability. These soils formed in loamy valley fill underlain largely by shale and siltstone. They are on slightly concave toe slopes, benches, and terraces. The native vegetation was mixed hardwoods. Slopes are 1 to 8 percent.

The Leadvale soils in this survey area are geographically associated with Amy, Enders, Linker, Muskogee, Mountainburg, Ouachita, Pickwick, Spadra, Taft, and Yorktown soils. Amy soils, which are on flood plains, do not have a fragipan. Enders soils, which are on higher slopes than Leadvale soils, are more than 35 percent clay in the upper 20 inches of the B horizon and have no fragipan. Linker soils, which are on higher ridgetops and side slopes, have no fragipan and are moderately deep over sandstone bedrock. Muskogee soils have no fragipan. Mountainburg soils, which are on ledges, benches, and hillsides, are shallow over bedrock. Ouachita soils, which are on flood plains, have no fragipan. Pickwick soils, which are on adjacent hills, have no fragipan and are well drained. Spadra soils, which are on stream terraces, have no fragipan. Taft soils, which are on lower terraces, have no argillic horizon above the fragipan. Yorktown soils, which are on low back swamps, are flooded for long periods.

Typical pedon of Leadvale silt loam, from an area of Leadvale silt loam, 1 to 3 percent slopes, in moist pasture NE1/4NW1/4NE1/4 sec. 28, T. 7 N., R. 13 W.:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

B2t—8 to 26 inches; yellowish brown (10YR 5/8) silt loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few fine pores; few fine roots; few fine brown concretions; strongly acid; gradual wavy boundary.

Bx1—26 to 46 inches; yellowish brown (10YR 5/6) silty clay loam; common medium faint brownish yellow (10YR 6/6) and light yellowish brown (10YR 6/4) mottles; moderate medium prismatic structure; firm; 60 percent of matrix compact and brittle; discontinuous clay films on faces of peds; common fine roots between prisms; few fine black and brown concretions; very strongly acid; gradual wavy boundary.

Bx2—46 to 64 inches; brownish yellow (10YR 6/6) silty clay loam; many medium distinct strong brown (7.5YR 5/8) and light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure; firm; 60 percent by volume compact and brittle; few thin patchy clay films on faces of peds; few fine roots between prisms; 10 percent by volume fragments of sandstone and shale 1/4 to 3 inches in diameter; very strongly acid; gradual wavy boundary.

C—64 to 73 inches; yellowish brown (10YR 5/6) silt loam; massive; 5 to 10 percent by volume fragments of sandstone and shale; very strongly acid.

Solum thickness ranges from 50 to 70 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout. Depth to fragipan ranges from 16 to 38 inches.

Thickness of the A horizon ranges from 3 to 10 inches. This horizon has hue of 10YR, values of 4 or 5, and chroma of 3, or value of 4 and chroma of 2.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8, and hue of 7.5YR, value of 5, and chroma of 6 or 8. It is silt loam or silty clay loam. The Bx and B2t horizons have similar ranges of color and texture. The Bx horizon has common to many mottles in shades of brown, gray, and yellow.

The C horizon ranges from silt loam to relict rock structure of acid shale.

Linker series

The Linker series consists of moderately deep, well drained, moderately permeable soils that formed in loamy residuum weathered from sandstone. These soils are on mountaintops, upper side slopes, and benches. The native vegetation was mixed hardwoods. Slopes are 1 to 30 percent.

The Linker soils in this survey area are geographically associated with Enders, Leadvale, and Mountainburg soils. The Enders soils, which are on crests and lower side slopes than Linker soils, are deep over bedrock and are more than 35 percent clay in the upper 20 inches of the B horizon. The Leadvale soils have a fine silty control section and a fragipan. The Mountainburg soils, which are on ledges, benches, and hillsides, are less than 20 inches deep over bedrock and are more than 35 percent coarse fragments in the B horizon.

Typical pedon of Linker fine sandy loam, from an area of Linker fine sandy loam, 3 to 8 percent slopes, in moist pasture NE1/4NW1/4SW1/4 sec. 20, T. 7 N., R. 13 W.:

Ap—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine roots; 5 percent by volume fragments of sandstone 1/4 to 1 inch in diameter; medium acid; abrupt smooth boundary.

A2—4 to 14 inches; brown (7.5YR 5/4) fine sandy loam; moderate medium granular structure; friable; common fine roots; 10 percent by volume fragments of sandstone 1/4 to 1 inch in diameter; strongly acid; clear wavy boundary.

B21t—14 to 24 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; few fine roots; few fine pores; 10 percent by volume fragments of sandstone 1/4 to 1 inch in diameter; very strongly acid; gradual wavy boundary.

B22t—24 to 37 inches; red (2.5YR 4/6) sandy clay loam; common fine prominent light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; firm; few thin discontinuous clay films on faces of peds; common fine pores; 10 percent by volume fragments of sandstone 1/4 to 1 inch in diameter; very strongly acid; abrupt wavy boundary.

R—37 inches; hard, level bedded, sandstone bedrock.

Solum thickness ranges from 20 to 40 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 4 to 7 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4, or hue of 7.5YR, value of 4 or 5, and chroma of 4. The A1 horizon, where present, has hue of 10YR, value or 3 or 4, and chroma of 2. The A2 horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 2 to 4.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam, clay loam, or loam.

The B3 horizon, where present, has similar range of color and texture as the B2t horizon.

McKamie series

The McKamie series consists of deep, well drained, very slowly permeable soils that formed in clayey alluvium. These soils are on high dissected stream terraces. The native vegetation was pine forest. Slopes are 3 to 8 percent.

The McKamie soils in this survey area are geographically associated with Acadia, Moreland, Muskogee, Perry, Sallisaw, and Yorktown soils. Acadia soils, which are nearly level, are somewhat poorly drained. Moreland soils, which are in back swamps, have slopes less than 3 percent. Muskogee soils, which are on high stream terraces that are not as dissected, have a fine silty control section. Perry soils, which are in flooded, low back swamps, have slopes less than 3 percent and are poorly drained. Sallisaw soils, which are on lower terraces, have a fine loamy control section. Yorktown soils, which are in lower back swamps, are flooded for long periods.

Typical pedon of McKamie silty clay loam, 3 to 8 percent slopes, severely eroded, in pasture SW1/4SE1/4NE1/4 sec. 36, T. 4 N., R. 14 W.:

A1—0 to 2 inches; yellowish red (5YR 5/6) silty clay loam; weak fine subangular blocky structure; firm; many fine roots; sand grains on faces of peds; slightly acid; abrupt smooth boundary.

B21t—2 to 8 inches; red (2.5YR 4/6) silty clay; few fine distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; few thin patchy clay films on faces of peds; few fine roots; few fine black accretions; medium acid; clear smooth boundary.

B22t—8 to 32 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; very firm; common fine concretions; common continuous clay films on faces of peds; few fine calcium carbonate concretions; medium acid; clear smooth boundary.

B23t—32 to 46 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; very firm; many continuous clay films on faces of peds; few fine calcium carbonate concretions; medium acid; gradual wavy boundary.

B24t—46 to 72 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; very firm; many continuous clay films on faces of peds; few yellowish brown (10YR 5/6) silt coats on faces of peds; few fine black concretions; common medium calcium carbonate concretions; neutral.

Solum thickness ranges from 36 to 72 inches. Unless the surface layer has been limed, reaction above 46 inches ranges from medium acid to very strongly acid. Reaction below 46 inches is neutral or mildly alkaline.

Thickness of the A horizon ranges from 2 to 4 inches. The A horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8.

The B2 horizon has hue of 5YR or 2.5YR, value of 3 or 4, and chroma of 4 to 8. It is silty clay or clay. Calcium carbonate concretions range from few to common in the lower B2t horizon.

The IIC horizon, where present, is stratified clay loam, silty clay loam, or silt loam. Colors are the same as in the B horizon.

Moreland series

The Moreland series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium in back swamps along the Arkansas River. These soils have a seasonally high water table late in winter and early in spring. The native vegetation was mixed hardwoods. Slopes are less than 1 percent.

The Moreland soils in the survey area are geographically associated with Acadia, Gallion, McKamie, Perry, and Roxana soils. Acadia soils, which are on higher terraces than Moreland soils, are less clayey in the upper part. Gallion soils, which are on natural levees, have a fine silty control section and are well drained. McKamie soils, which are on higher terraces, have slopes of more than 3 percent and are well drained. Perry soils, which are on low back swamps, are poorly drained. Roxana soils, which are on flood plains, are well drained and have a coarse silty control section.

Typical pedon of Moreland silty clay in cultivated area SW1/4NW1/4SW1/4 sec. 32, T. 4 N., R. 27 W.:

Ap—0 to 4 inches; dark reddish brown (5YR 3/3) silty clay; moderate medium subangular blocky structure; firm; many fine roots; slightly acid; clear smooth boundary.

B21—4 to 15 inches; dark reddish brown (5YR 3/3) silty clay; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; neutral; abrupt wavy boundary.

B22—15 to 25 inches; dark reddish brown (5YR 3/3) silty clay; moderate medium subangular blocky structure; very firm; few fine slickensides; few fine roots; few fine pores; neutral; gradual wavy boundary.

B23—25 to 47 inches; dark reddish brown (5YR 3/4) silty clay; few fine prominent gray (10YR 5/1) mottles; moderate medium subangular blocky structure; very firm; common medium slickensides; common fine pressure faces; few fine black concretions; neutral; gradual wavy boundary.

B31—47 to 61 inches; reddish brown (5YR 4/4) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very firm; few fine calcium carbonate accretions; few fine black concretions; neutral; gradual wavy boundary.

B32—61 to 76 inches; reddish brown (5YR 4/4) silty clay; moderate medium subangular blocky structure; firm; few fine calcium carbonate accretions; few gray streaks along root channels; mildly alkaline, calcareous.

Solum thickness ranges from 50 to 80 inches. Slickensides are within 40 inches of the surface.

Thickness of the A horizon ranges from 4 to 10 inches. The A horizon has hue of 5YR, value of 3, and chroma of 2 or 3, or hue of 7.5YR, value of 3, and chroma of 2. Reaction ranges from slightly acid to mildly alkaline.

The upper part of the B2 horizon has hue of 5YR, value of 3, and chroma of 2 or 3. The lower part of the B2 horizon has hue of 5YR, value of 3 or 4, and chroma of 3 or 4. The lower B2 horizon has few to common fine mottles of gray and brown. Reaction ranges from neutral to moderately alkaline.

Mountainburg series

The Mountainburg series consists of shallow, well drained, moderately rapidly permeable soils that formed in residuum from hard, massive, horizontally bedded sandstone and interbedded shales. These soils are on ledges, ridgetops, hillsides, and benches. The native vegetation was mixed pine and hardwoods. Slopes are 3 to 40 percent.

The Mountainburg soils in the survey area are geographically associated with Enders, Leadvale, and Linker soils. Enders soils, which are on adjacent side slopes, have a clayey control section and are deep over bedrock. Leadvale soils, which are on terraces, have a fine silty control section and a fragipan. Linker soils, which are on benches and plateaus, are moderately deep over bedrock and have a fine loamy control section.

Typical pedon of Mountainburg very stony fine sandy loam from an area of Mountainburg very stony fine sandy loam, 12 to 40 percent slopes, in wooded area NE1/4SW1/4NE1/4 sec. 3, T. 8 N., R. 14 W.:

A1—0 to 5 inches; dark brown (10YR 3/3) very stony fine sandy loam; weak medium granular structure; friable; many fine roots; 40 percent by volume fragments of sandstone ranging from 6 to 24 inches in diameter; strongly acid; clear smooth boundary.

A2—5 to 11 inches; strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) very stony fine sandy loam; weak medium granular structure; friable; common fine roots; few fine pores; 40 percent by volume fragments of sandstone 6 to 24 inches in diameter; strongly acid; gradual wavy boundary.

B2t—11 to 16 inches; strong brown (7.5YR 5/6) very stony sandy clay loam; few fine distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common patchy clay films on faces of peds; few fine roots; few fine pores; 50 percent by volume fragments of sandstone 6 to 24 inches in diameter; very strongly acid; abrupt irregular boundary.

R—16 to 18 inches; hard, acid, sandstone bedrock.

Solum thickness ranges from 10 to 20 inches.

Thickness of the A horizon ranges from 6 to 12 inches. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is gravelly fine sandy loam or very stony fine sandy loam. The A2 horizon has hue of 10YR, value of 5, and chroma of 4 or 6, and hue of 7.5YR, value of 5, and chroma of 6. The A horizon is 15 to 60 percent coarse fragments by volume. Unless the surface layer has been limed, reaction is medium acid or strongly acid.

The B2t horizon has hue of 7.5YR, value of 5, and chroma of 6, or hue of 5YR, value of 4, and chroma of 8. The B horizon is 35 to 50 percent coarse fragments. Reaction is strongly or very strongly acid.

Muskogee series

The Muskogee series consists of deep, moderately well drained, slowly permeable soils that formed in thin loamy material and the underlying clayey alluvium. These soils are on high stream terraces. The native vegetation was mixed hardwoods. Slopes are 1 to 8 percent.

The Muskogee soils in this survey area are geographically associated with Acadia, Leadvale, McKamie, and Sallisaw soils. Acadia soils, which are on lower terraces than Muskogee soils are somewhat poorly drained. Leadvale soils, which are also on lower terraces, have a fragipan. McKamie soils, which are on higher terraces, have a fine textured control section. Sallisaw soils, which are on lower terraces, have a fine loamy control section.

Typical pedon of Muskogee silt loam from an area of Muskogee silt loam, 1 to 3 percent slopes, in moist pasture NE1/4SE1/4NE1/4 sec. 30, T. 4 N., R. 14 W.:

Ap—0 to 1 inch; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

A2—1 to 5 inches; pale brown (10YR 6/3) silt loam; few fine faint yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; common fine roots; common fine pores; strongly acid; gradual wavy boundary.

B21t—5 to 20 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint pale brown (10YR 6/3) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; common fine roots; common fine pores; strongly acid; clear smooth boundary.

B22t—20 to 34 inches; light brownish gray (10YR 6/2) silty clay; many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; sticky; few fine roots; common fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—34 to 58 inches; gray (10YR 6/1) silty clay; common medium prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; very sticky; common patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B24t—58 to 78 inches; red (2.5YR 4/8) silty clay; common medium prominent light gray (7.5YR, N 7/0) mottles; moderate medium subangular blocky structure; very firm; sticky; common patchy clay films on faces of peds; very strongly acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid throughout.

Thickness of the A horizon ranges from 4 to 10 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3, or value of 5 and chroma of 3. Eroded phases have hue of 5YR, value of 5, and chroma of 6. The Ap horizon is silt loam or silty clay loam. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3.

The B21t horizon has hues of 10YR or 7.5YR, value of 5, and chroma of 6. Mottles are few or common in shades of gray and brown. The B22t and B23t horizons have hue of 10YR, value of 5 or 7, and chroma of 1 or 2. Mottles are many or common in shades of red or brown. Texture of the B22t, B23t, and B24t horizons is silty clay or clay. The B24t horizon has hue of 2.5YR, value of 4, and chroma of 8, or hue of 5YR, value of 5, and chroma of 8. Mottles are many or common in shades of gray.

Ouachita series

The Ouachita series consists of deep, well drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are on level flood plains and natural levees along tributaries of the Arkansas River. The native vegetation was pine and mixed hardwoods. Slopes are dominantly less than 1 percent.

The Ouachita soils in this survey area are geographically associated with Amy, Leadvale, Pickwick, and Spadra soils. Amy soils, which are on lower flood plains than Ouachita soils, are poorly drained. Leadvale soils, which are on higher terraces, have a fragipan. Pickwick soils, which are on higher terraces, have an argillic horizon. Spadra soils, which are on higher flood plains, have an argillic horizon.

Typical pedon of Ouachita silt loam, occasionally flooded, in moist cultivated area SW1/4SW1/4SE1/4 sec. 8, T. 4 N., R. 14 W.:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; many fine pores; strongly acid; abrupt smooth boundary.

A12—9 to 16 inches; brown (10YR 4/3) silt loam; common fine distinct pale brown (10YR 6/3) mottles; moderate medium granular structure; friable; common fine roots; common fine pores; strongly acid; clear smooth boundary.

B21—16 to 41 inches; dark yellowish brown (10YR 4/4) silt loam; few fine distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B22—41 to 63 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct pale brown (10YR 6/3) and few fine distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

B23—63 to 76 inches; mottled yellowish brown (10YR 5/4), gray (10YR 6/1), and brown (10YR 4/3) silt loam; moderate medium subangular blocky structure; friable; very strongly acid.

Solum thickness ranges from 40 to 76 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 12 to 20 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A12 horizon has hue of 10YR, value of 4, and chroma of 3 or 4.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles are few to common in shades of brown. Gray mottles are below 30 inches. Texture is silt loam or silty clay loam.

Perry series

The Perry series consists of deep, poorly drained, very slowly permeable soils that formed in clayey alluvium in low back swamps. These soils are wet for long periods late in winter and early in spring. They are subject to occasional flooding. The native vegetation was mixed hardwoods. Slopes are less than 1 percent.

The Perry soils in this survey area are geographically associated with Gallion, McKamie, Moreland, and Yorktown soils. Gallion soils, which are on natural levees and low terraces, have a fine silty control section and are well drained. McKamie soils have slopes greater than 3 percent and are well drained. Moreland soils, which are slightly higher than Perry soils, have a mollic epipedon and are somewhat poorly drained. Yorktown soils, which are in lower back swamps, are flooded for long periods.

Typical pedon of Perry clay, occasionally flooded, in cultivated field NE1/4NE1/4NE1/4 sec. 21, T. 6 N., R. 14 W.:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) clay; few medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; common fine roots; strongly acid; abrupt smooth boundary.

B21g—9 to 19 inches; dark gray (10YR 4/1) clay; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few medium slickensides; few fine roots; strongly acid; clear smooth boundary.

B22g—19 to 29 inches; gray (10YR 5/1) clay; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; common medium slickensides; few fine roots; medium acid; clear smooth boundary.

IIB3—29 to 44 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; very firm; many small black concretions; common slickensides; few fine pores; few fine roots; moderately alkaline; clear smooth boundary.

IIC—44 to 67 inches; reddish brown (5YR 4/4) clay; common medium prominent dark grayish brown (10YR 4/2) mottles; weak coarse subangular blocky structure; very firm; few fine black accretions; few fine calcium carbonate concretions; moderately alkaline.

Solum thickness ranges from 30 to 60 inches. Depth to the IIB ranges from 16 to 36 inches. Unless the surface layer has been limed, reaction in the A and B2g horizons ranges from medium acid to very strongly acid. Reaction in the IIB and IIC horizons is mildly alkaline or moderately alkaline.

Thickness of the A horizon ranges from 4 to 9 inches. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The B2g horizon has hue of 10YR, value of 4 or 5, chroma of 1, and mottles in shades of brown. The average clay content ranges from 60 to 80 percent.

The IIC horizon has hue of 5YR, value of 4 or 5, and chroma of 2 through 4, or hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4. Mottles are few or common in shades of brown.

Pickwick series

The Pickwick series consists of deep, well drained, moderately permeable soils that formed in loamy materials on stream terraces. The native vegetation was mixed hardwoods. Slopes are 1 to 8 percent.

The Pickwick soils in this survey area are geographically associated with Leadvale, Ouachita, Spadra, and Taft soils. The Leadvale soils, which are on lower terraces than Pickwick soils, have a fragipan. Ouachita soils, which are on flood plains, have no argillic horizon. Spadra soils, which are on lower terraces, have a fine loamy control section. Taft soils, which are on low terraces, are somewhat poorly drained and have a fragipan.

Typical pedon of Pickwick silt loam, in cultivated area of Pickwick silt loam, 1 to 3 percent slopes, SW1/4NE1/4SW1/4 sec. 9, T. 7 N., R. 14 W.:

Ap—0 to 4 inches; strong brown (7.5YR 5/6) silt loam; weak fine granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

B1—4 to 12 inches; yellowish red (5YR 4/6) silty clay loam; weak fine subangular blocky structure; friable; common fine roots; common fine pores; few fine black concretions; strongly acid; gradual wavy boundary.

B21t—12 to 21 inches; yellowish red (5YR 4/6) silty clay loam; few fine prominent light brown (7.5YR 6/4) mottles; moderate medium subangular blocky structure; friable; few patchy clay films on faces of peds; few fine pores; few fine black concretions; few fine roots; strongly acid; clear smooth boundary.

B22t—21 to 32 inches; yellowish red (5YR 4/6) silty clay loam; common medium prominent pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable; few fine roots; few patchy clay films on faces of peds; strongly acid; clear smooth boundary.

B23t—32 to 46 inches; yellowish red (5YR 5/6) clay loam; common medium prominent pale brown (10YR 6/3) and dark reddish brown (2.5YR 3/4) mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

B24t—46 to 67 inches; red (2.5YR 4/6) clay loam; common medium prominent light brown (7.5YR 6/4) mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 80 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 4 to 9 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4, or value of 5, and chroma of 6, or hue of 7.5YR, value of 5, and chroma of 6.

The B1 horizon has hue of 5YR, value of 4, and chroma of 4 or 6. It is silt loam or silty clay loam. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 or 6. Mottles are few to common in shades of brown. Texture is silty clay loam or clay loam.

The B3 horizon, when present, has the same range of color and texture as the B2t horizon.

The Pickwick soils in Faulkner County are mottled at shallower depths than is defined in the range of the series. This difference, however, does not alter use and management.

Roxana series

The Roxana series consists of deep, well drained, moderately permeable soils that formed in stratified, loamy alluvium. These soils are on flood plains along the Arkansas River. The native vegetation was pecan, cottonwood, and willow. Slopes are dominantly less than 2 percent.

The Roxana soils in this survey area are geographically associated with Gallion and Moreland soils. Gallion soils, which are on levees and low terraces, have an argillic horizon. Moreland soils, which are in backswamp areas, have a mollic epipedon, are clayey, and have vertic properties.

Typical pedon of Roxana very fine sandy loam in moist pasture NE1/4NE1/4SW1/4 sec. 28, T. 4 N., R. 14 W.:

Ap—0 to 6 inches; dark yellowish brown (10YR 3/4) very fine sandy loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

C1—6 to 13 inches; brown (7.5YR 4/4) very fine sandy loam; weak thin platy structure; friable; common fine roots; neutral; gradual wavy boundary.

C2—13 to 24 inches; strong brown (7.5YR 5/6) very fine sandy loam; massive; friable; common bedding planes; few fine roots; neutral; gradual wavy boundary.

C3—24 to 52 inches; yellowish red (5YR 5/8) very fine sandy loam; massive; friable; common bedding planes; few fine roots; neutral; clear wavy boundary.

C4—52 to 75 inches; yellowish red (5YR 5/8) very fine sandy loam; thin strata of light brown (7.5YR 6/4) very fine sand; massive; friable; few fine roots; common bedding planes; few fine black accretions; neutral.

Bedding planes are evident in the 10- to 40-inch control section. Reaction is slightly acid or neutral in the surface layer and ranges from neutral to moderately alkaline in the underlying layers.

Thickness of the A horizon ranges from 3 to 6 inches. The A horizon has hue of 5YR, value of 4, and chroma of 4 or 6, or value of 3 and chroma of 4, or hue of 10YR, value of 3, and chroma of 4.

The C horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8, or hue of 7.5YR, value of 4, and chroma of 4, or value of 5, and chroma of 6. It is stratified with very fine sandy loam, silt loam, or loamy very fine sand. Some pedons have a buried A horizon below 40 inches.

Sallisaw series

The Sallisaw series consists of deep, well drained, moderately permeable soils that formed in loamy and gravelly alluvium. These soils are on high gravelly terraces near the Arkansas River. The native vegetation was mixed hardwoods and shortleaf pine. Slopes are 3 to 12 percent.

The Sallisaw soils in this survey area are geographically associated with McKamie and Muskogee soils. McKamie soils are on lower terraces than Sallisaw soils and are clayey throughout. Muskogee soils are on higher terraces and have a fine silty control section.

Typical pedon of Sallisaw gravelly sandy loam in area of Sallisaw gravelly sandy loam, 8 to 12 percent slopes, on wooded hillside SW1/4SW1/4SW1/4 sec. 6, T. 3 N., R. 13 W.:

A1—0 to 5 inches; yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; friable; many fine roots; 15 percent

by volume rounded gravel, 1/2 to 1 inch in diameter; few fine pores; slightly acid; clear smooth boundary.

B1—5 to 12 inches; strong brown (7.5YR 5/8) gravelly sandy loam; few medium prominent yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots and pores; 15 percent by volume rounded gravel 1/2 to 1 inch in diameter; strongly acid; gradual wavy boundary.

B21t—12 to 40 inches; red (2.5YR 4/6) gravelly sandy clay loam; common medium prominent brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; 30 percent by volume rounded gravel 1/4 to 2 inches in diameter; strongly acid; gradual wavy boundary.

B22t—40 to 72 inches; red (2.5YR 4/8) gravelly sandy clay loam; common medium prominent reddish yellow (7.5YR 6/6) and light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; 30 percent by volume rounded gravel 1/2 to 2 inches in diameter; very strongly acid.

Solum thickness is more than 60 inches.

Thickness of the A horizon ranges from 5 to 9 inches. The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Reaction is slightly acid or medium acid.

The B1 horizon has hue of 7.5YR or 5YR, value of 5, and chroma of 6 or 8. It is gravelly loam or gravelly sandy loam. The B2t horizon has hue of 2.5YR or 5YR, value of 4, and chroma of 4, 6, or 8, value of 5 and chroma of 6 or 8. It is mottled in shades of brown above 40 inches and shades of gray below 40 inches. Textures are gravelly sandy clay loam or gravelly clay loam. Reaction is strongly acid or very strongly acid.

The Sallisaw soils in Faulkner County have a lower content of gravel and a lower pH below 40 inches than is defined in the range for the series. These differences, however, do not alter use and management.

Spadra series

The Spadra series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium on stream terraces. The native vegetation was mixed hardwoods and shortleaf pine. Slopes are 1 to 3 percent.

The Spadra soils in this survey area are geographically associated with Amy, Leadvale, Ouachita, and Pickwick soils. Amy soils, which are on flood plains, are poorly drained. Leadvale soils, which are on higher terraces, have a fragipan. Ouachita soils, which are on flood plains, have no argillic horizon. Pickwick soils, which are on higher terraces, have a fine silty control section.

Typical pedon of Spadra fine sandy loam, 1 to 3 percent slopes, in pasture NE1/4SW1/4NW1/4 sec. 2, T. 8 N., R. 14 W.:

Ap—0 to 7 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B1—7 to 13 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; many fine roots; few fine pores; strongly acid; gradual smooth boundary.

B21t—13 to 30 inches; reddish brown (5YR 4/4) loam; few common distinct brown (7.5YR 4/4) and prominent yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common patchy clay films on faces of peds; common fine roots; few fine pores; strongly acid; gradual smooth boundary.

B22t—30 to 44 inches; reddish brown (5YR 4/4) sandy clay loam; moderate fine subangular blocky structure; friable; common patchy clay films on faces of peds; few fine roots; very strongly acid; clear smooth boundary.

C—44 to 73 inches; reddish brown (5YR 4/4) loam; massive; friable; few fine roots; few fine black accretions; strongly acid.

Solum thickness ranges from 40 to 60 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 5 to 9 inches. The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4, or hue of 7.5YR, value of 4, and chroma of 4.

The B horizon has hue of 10YR, 7.5YR, or 5YR, value of 4, and chroma of 4. It is loam or sandy clay loam.

The C horizon has hue of 10YR, value of 4, and chroma of 3, or hue of 7.5YR or 5YR, value of 4, and chroma of 4. It is loam or fine sandy loam.

Taft series

The Taft series consists of deep, somewhat poorly drained, slowly permeable soils that formed in loamy alluvium derived from shale and sandstone. They are on low stream terraces and in depressions. They have a seasonal perched water table late in winter and early in spring. The native vegetation was mixed hardwoods. Slopes are 0 to 2 percent.

The Taft soils in this survey area are geographically associated with Amy, Leadvale, and Pickwick soils. Amy soils, which are on flood plains, are poorly drained and have no fragipan. Leadvale soils, which are on higher terraces than the Taft soils, have an argillic horizon above the fragipan. Pickwick soils, which are also on the higher terraces, are well drained and have no fragipan.

Typical pedon of Taft silt loam, 0 to 2 percent slopes, in wooded field SW1/4SE1/4SW1/4 sec. 30, T. 4 N., R. 13 W.:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

A2—1 to 6 inches; light olive brown (2.5Y 5/4) silt loam; few fine distinct dark yellowish brown (10YR 4/4) and pale brown (10YR 6/3) mottles; weak medium granular structure; friable; many roots; very strongly acid; gradual smooth boundary.

B21—6 to 16 inches; pale brown (10YR 6/3) silt loam; common medium distinct gray (10YR 6/1) and prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few thin oxide stains on vertical faces of some peds; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

B22—16 to 24 inches; light yellowish brown (2.5Y 6/4) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and common medium faint light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; friable; few thin oxide stains on vertical faces of some peds; few fine roots; few fine pores; common fine black and brown accretions; very strongly acid; clear smooth boundary.

Bx1—A'2—24 to 42 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular and angular blocky; 70 percent by volume compact and brittle; firm, hard; 10 percent by volume light gray (10YR 7/1) silt tongues 1/2 to 1 inch wide through the horizon and between prisms; thick clay films in pores; patchy clay films on faces of peds; few fine angular fragments of shale; common pores; few fine black accretions; very strongly acid; clear smooth boundary.

B'2t—42 to 76 inches; mottled yellowish brown (10YR 5/4), gray (10YR 6/1), and light yellowish brown (2.5Y 6/4) silty clay loam; moderate medium subangular blocky structure; firm; 10 percent by volume fragments of shale; 3 to 5 percent by volume fragments of chert; common patchy clay films; strongly acid.

Solum thickness ranges from 50 to 76 inches. Depth to the fragipan ranges from 20 to 36 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid throughout.

Thickness of the A horizon ranges from 5 to 12 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2, or value of 5 and chroma of 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3, or hue of 2.5Y, value of 5, and chroma of 4.

The B2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4, or hue of 2.5Y, value of 5, and chroma of 4. Texture is silt loam or silty clay loam. Mottles in chroma of 2 or less occur within 10 inches of the top of the B horizon. The Bx horizon, which is mottled in shades of brown and gray, contains light gray tongues of silt. The B'2t horizon is mottled in shades of brown and gray.

Yorktown series

The Yorktown series consists of deep, very poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are in low back swamps that are inundated at least 10 months of each year. The native vegetation was baldcypress, water-tupelo, and buttonbush. Slopes are less than 1 percent.

The Yorktown soils in this survey area are geographically associated with Leadvale, McKamie, and Perry soils. Leadvale and McKamie soils are on terraces and Perry soils are in the higher back swamps. Leadvale soils have a fine silty control section and a fragipan. McKamie soils, which have slopes greater than 3 percent, are well drained. Perry soils have a reddish brown IIB horizon above 40 inches and cracks to a depth of 20 inches in most years.

Typical pedon of Yorktown silty clay SE1/4 SE1/4NE1/4 sec. 29, T. 4 N., R. 13 W.:

A1—0 to 3 inches; dark gray (5Y 4/1) silty clay; few medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; common fine roots; medium acid; abrupt smooth boundary.

B21g—3 to 10 inches; gray (5Y 5/1) clay; many medium prominent brown (7.5YR 4/4), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm; common fine roots; medium acid; gradual wavy boundary.

B22g—10 to 17 inches; gray (5Y 5/1) clay; many medium prominent yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; common fine roots; neutral; gradual smooth boundary.

B23g—17 to 34 inches; dark gray (5Y 4/1) clay; many fine and medium prominent dark brown (7.5YR 3/2) mottles; moderate medium subangular blocky structure; very firm; common medium roots; few fine pressure faces; slightly acid; gradual wavy boundary.

B24g—34 to 38 inches; gray (5Y 5/1) clay; common fine prominent yellowish brown (10YR 5/6) and few medium prominent dark reddish brown (5Y 3/4) mottles; moderate medium subangular blocky structure; very firm; few fine roots; few fine pressure faces; common fine dark brown accretions; neutral; gradual wavy boundary..

B25g—38 to 46 inches; mottled gray (5Y 5/1) and yellowish brown (10YR 5/6) clay; moderate medium subangular blocky structure; very firm; few smooth slickensides 1/2 to 1 inch in diameter; few fine roots; neutral; gradual wavy boundary.

B25g—46 to 50 inches; gray (5BG 5/1) clay; many fine and medium prominent yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few smooth slickensides 1/2 to 1 inch in diameter; few fine roots; neutral; abrupt smooth boundary.

B3—50 to 60 inches; dark reddish brown (5YR 3/4) clay; few fine prominent gray (5Y 5/1) mottles; strong fine and medium blocky structure; very firm; few smooth slickensides up to 1 inch in diameter; common fine pressure faces; common fine accretions; greenish gray (5G 6/1) fillings in root channels; few fine roots; mildly alkaline, calcareous.

Solum thickness ranges from 50 to 70 inches. Depth to the B3 horizon ranges from 40 to 55 inches. The A and B2g horizons range from neutral to medium acid. The B3 horizon is mildly alkaline.

Thickness of the A horizon ranges from 3 to 8 inches thick. The A horizon has hue of 5Y, value of 4 or 5, and chroma of 1.

The B2g horizon has hue of 5Y and 5BG, value of 4 or 5, and chroma of 1 or less. It is mottled in shades of brown.

Formation of the soils

This section describes the factors of soil formation and relates them to the formation of soils in Faulkner County. It explains the processes of soil formation. It also defines the current system of soil classification and classifies the soils of Faulkner County according to this system.

Factors of soil formation

Soil is a natural, three-dimensional body on the earth's surface that supports plants and has properties resulting from the integrated effects of climate and living matter acting on early parent material, as conditioned by relief over periods of time.

The interaction of five main factors results in differences among soils. These factors are climate during and after the accumulation of the parent material; the kind of plants and organisms living in the soils; physical and chemical composition of the parent material; the relief of the land and the runoff produced; and the effect of time on all the above factors.

The effect of one factor can differ from place to place, but the kind of soil that forms is determined by the interaction of all the factors. In the following paragraphs, the factors of soil formation are discussed as they relate to the soils of Faulkner County.

Climate

The climate of Faulkner County is characterized by mild winters, warm or hot summers, and generally adequate rainfall. The generally warm temperatures and high precipitation are probably similar to the conditions under which the soils in the county formed. The average daily maximum temperature at Conway in July is about 93 degrees F, and the average in January is about 52 degrees. The total annual rainfall, about 49 inches, is well distributed throughout the year. For additional information about the climate refer to the section, "General nature of the county."

The warm, moist climate promotes rapid soil formation. Warm temperatures encourage rapid chemical reactions. Large amounts of water that move through the soils help remove dissolved and suspended materials. Organic acids formed by rapidly decomposing plants hasten the formation of clay minerals and the removal of carbonates. Because the soils are frozen only to shallow depths for short periods, soil formation continues almost the year around. The climate throughout the county is uniform, but its effect is modified locally by runoff. Climate alone does

not account for differences in the soils of Faulkner County.

Living organisms

The higher plants and animals, as well as insects, bacteria, and fungi, are important in the formation of soils. They cause gains and losses in organic matter, nitrogen, and plant nutrients and changes in structure and porosity.

Before Faulkner County was settled, native vegetation probably had more influence on soil formation than did animal activity. Hardwood and pine forests, broken by swamps, covered the county. Differences in native vegetation seem to have been caused by variations in drainage and, to a lesser degree, parent material. Because the type of vegetation was fairly uniform throughout the county, differences amoung the soils cannot be directly related to vegetation.

Man is important to the future rate and direction of soil formation. He clears the forest, cultivates the soils, and introduces new kinds of plants. He adds fertilizer and lime and chemicals for insect, disease, and weed control. Improving drainage and grading the soil surface also affect the future development of soils. Results of these changes may not be evident for centuries. Nevertheless, the complex of living organisms affecting soil formation in Faulkner County has been drastically changed by man.

Parent material

The soils of Faulkner County formed in alluvium and residuum derived from shale and sandstone bedrock.

The alluvium is deposited by the Arkansas River and its tributaries. It is a mixture of minerals transported from several States and derived from several types or rock. Many minerals in the Arkansas River alluvium are only partially weathered. As a result, the soils that formed are high in natural fertility, for example, Gallion and Roxana soils. Most minerals in the alluvium from tributaries are highly weathered. Soils that form in this material are low in natural fertility, for example, Ouachita and Spadra soils.

Because the weathering bedrock is protected from erosion, the residuum can accumulate. The soils that form in residuum have properties directly related to the characteristics of the parent bedrock. Sandstone bedrock weathers into loamy materials containing coarse fragments of resistant minerals. Linker and Mountainburg are examples of soils formed in this material. Shale bedrock weathers into clayey materials containing a few fragments of resistant minerals. Enders soils, for example, formed in material weathered from shale.

Relief

The other soil-forming factors are affected by relief through its effect on drainage, runoff, erosion, and percolation of water through the soil. Some of the greatest differences among the soils result mainly from differences in relief.

On the bottom land of Faulkner County, relief ranges from level back swamps to undulating ridges and swales. Local differences are commonly less than 1 foot on the back swamps and 3 to 4 feet on ridges and in swales.

The uplands range from broad, gently sloping valleys to very steep ridges. Overall relief is a series of nearly parallel and generally east-west trending gently sloping valleys and strongly sloping to steep nearly parallel ridges. Local elevations differ by 50 to 300 feet.

Time

The time required for formation of a soil depends largely on the other factors of soil formation. Less time generally is required if the climate is warm and humid and the vegetation luxuriant. If other factors are equal, less time is also required where the parent material is sandy or loamy than where it is clayey.

In terms of geologic time, some soils in Faulkner County are young and some are old. The soils on the Arkansas River bottom land, such as the Gallion and Roxana, are young. They are estimated to be between 10,000 and 20,000 years old. The soils on the uplands, such as the Enders and Linker, are old. These soils are estimated to be more than 100,000 years old. The degree of soil development is a good indication of the age of a soil. Roxana soils have been in place so short a time that they show little evidence of development and horizonation. Enders soils, which formed in residuum, are strongly developed and show distinct horizons.

Processes of soil formation

Evidence of soil forming factors is recorded in the soil profile by a succession of layers or horizons from the surface to the parent material. These horizons differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction.

Most soil profiles contain three major horizons, the A horizon, the B, and the C. Very young soils do not have a B horizon.

The A horizon can be the horizon of maximum accumulation of organic matter, the A1 horizon or the surface layer, or it can be the horizon of maximum leaching of dissolved or suspended materials, the A2 horizon or the subsurface layer.

The B horizon, which is directly beneath the A horizon, is sometimes called the subsoil. It is the horizon of maximum accumulation of dissolved or suspended materials, such as iron and clay. Commonly, the B horizon has blocky structure and is firmer than the horizon above and the one below.

Beneath the B is the C horizon, which has been affected little by the soil forming processes. The C horizon can be materially modified, however, by weathering. In some young soils, the C horizon is directly beneath the A horizon and has been slightly modified by living organisms, as well as by weathering.

Several processes have been active in the formation of soil horizons in the soils of Faulkner County. Among these processes are: (1) the accumulation of organic matter, (2) leaching of calcium carbonates and bases, (3) reduction and transfer of iron, and (4) formation and translocation of silicate clay minerals. More than one of these processes has been active in most of the soils of Faulkner County.

Accumulation of organic matter in the upper part of the profile to form an A1 horizon has been an important process. The soils of Faulkner County range from high to low in content of organic matter.

Leaching of carbonates and bases has occurred to some degree in nearly all soils in the county. Soil scientists generally agree that bases are leached downward before silicate clay minerals move. Most of the soils in Faulkner County are highly leached. Some are only slightly leached.

Reduction and transfer of iron has occurred, to a significant degree, in the somewhat poorly drained and poorly drained soils. In naturally wet soils, this process is called gleying. Gray colors in the layers below the surface layer indicate the reduction and loss of iron. Some horizons contain reddish or yellowish mottles and concretions derived from segregated iron. Gleying is pronounced in several soils. Among the gleyed soils are Acadia, Amy, and Perry soils.

In several soils in Faulkner County, the translocation of clay minerals has contributed to the formation of horizons. In some places, the eluviated A2 horizon has been destroyed by cultivation. In other places its structure is granular to platy, its clay content is less than in the lower horizons, and its color is lighter. Generally, clay films have accumulated in pores and on surfaces of peds in the B horizon. The soils were probably leached of carbonates and soluble salts to a great extent before translocation of silicate clay occurred.

Leaching of bases and translocation of silicate clay are among the most important processes in horizon differentiation in the soils of Faulkner County.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil Taxonomy" (*9*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 22, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol.* An example is Ultisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning moist but not wet, plus *Ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Hapludults (*Hapl*, meaning simple horizons, plus *udult*, the suborder of Ultisols that have a udic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceeding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, siliceous, thermic, Typic Hapludults.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Accretions. Soft, local concentrations of local compounds that form unindurated bodies of various sizes, shapes, and colors. The composition of moist accretions is unlike that of the surrounding soil. Calcium carbonate, iron, and manganese oxides are common compounds in accretions.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	More than 9

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Hardened local concentrations of certain chemical compounds that form indurated grains, pellets, or nodules of various sizes, shapes, and colors. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. A delay in grazing until range plants have reached a specified stage of growth. Grazing is deferred in order to increase the vigor of forage and to allow desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime. Excess carbonates. Excessive carbonates, or lime, restrict the growth of some plants.

Excess salts. Excess water soluble salts. Excessive salts restrict the growth of most plants.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity*, or *capillary capacity.*

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green manure (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants are those that follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. Inadequate strength for supporting loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moderately fine textured (moderately heavy textured) soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium,

sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characterisitc that affects management. These differencees are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Pitting. Formation of pits as a result of the melting of ground ice after the removal of plant cover.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Polypedon. A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range (or rangeland). Land that, for the most part, produces native plants suitable for grazing by livestock; includes land supporting some forest trees.

Range condition. The health or productivity of forage plants on a given range, in terms of the potential productivity under normal climate and the best practical management. Condition classes generally recognized are—*excellent, good, fair,* and *poor.* The classification is based on the percentage of original, or assumed climax vegetation on a site, as compared to what has been observed to grow on it when well managed.

Range site. An area of range where climate, soil, and relief are sufficiently uniform to produce a distinct kind and amount of native vegetation.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Seepage. The rapid movement of water through the soil. Seepage abversely affects the specified use.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-alumina ratio. The molecular ratio of silica to alumina in soil, clay, or any alumino-silicate mineral.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stone line. A concentration of coarse fragments in soils that generally marks an old weathering surface. In a cross section, the line may be one fragment or more thick. The line generally overlies material that weathered in place and marks the top of a paleosol. It is ordinarily overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil, or partly worked into the soil, to provide protection from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitaion is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt*, *silt loam*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Trace elements. The chemical elements in soils, in only extremely small amounts, essential to plant growth. Examples are zinc, cobalt, manganese, copper, and iron.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decompostion of the material.

Well graded. Refers to a soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Illustrations

Figure 1.—Stand of mixed hardwoods on Amy soils, frequently flooded.

Figure 2.—Shallow rooting in clayey subsoil of Enders gravelly fine sandy loam, 12 to 45 percent slopes.

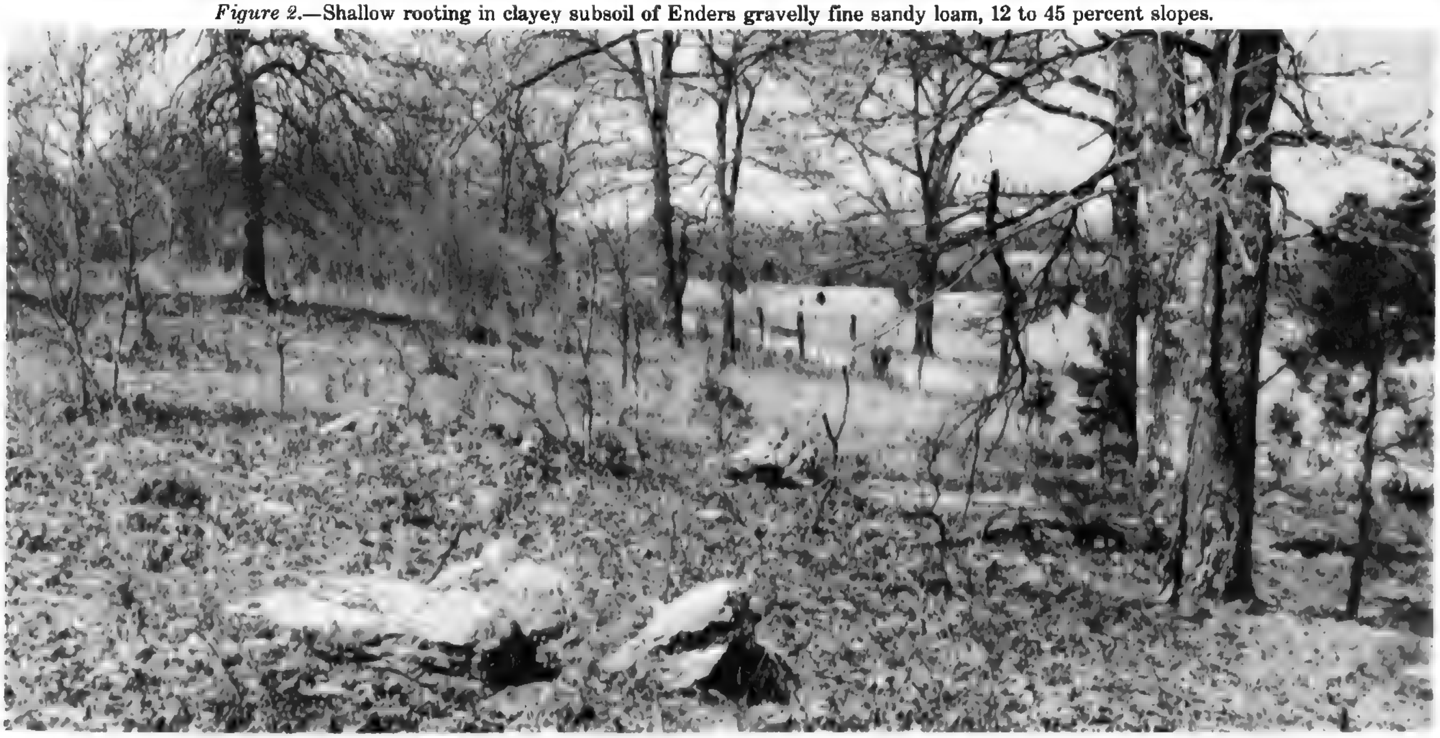

Figure 3.—Stones in field of mixed pasture and woodland on Mountainburg very stony fine sandy loam, 8 to 12 percent slopes.

Figure 4.—Ledge of sandstone bedrock on hillside of Mountainburg very stony fine sandy loam, 12 to 40 percent slopes.

Figure 5.—Pasture of common bermudagrass and tall fescue on Ouachita silt loam, occasionally flooded.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days[2]	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	F	F	F	F	F		In	In	In		In
January----	52.0	29.9	41.0	76	7	15	3.77	1.64	5.49	6	1.9
February---	56.6	33.0	44.8	78	11	43	3.59	1.85	5.01	5	1.2
March------	64.4	40.1	52.3	87	18	190	4.95	2.54	6.90	8	.5
April------	75.2	50.4	62.8	89	28	384	4.90	2.45	6.89	7	.0
May--------	82.2	58.0	70.1	93	39	623	5.16	2.59	7.25	6	.0
June-------	89.3	65.5	77.4	100	49	822	3.85	1.14	6.02	6	.0
July-------	93.4	69.3	81.4	104	55	973	3.39	1.77	4.70	6	.0
August-----	92.9	67.5	80.2	103	53	936	2.84	1.32	4.07	5	.0
September--	86.4	61.1	73.8	99	42	714	4.53	2.38	6.29	5	.0
October----	76.9	49.4	63.2	92	29	413	3.02	.98	4.64	4	.0
November---	63.3	39.3	51.3	83	17	108	4.56	2.19	6.49	5	.3
December---	53.8	32.7	43.2	76	10	30	4.10	2.30	5.56	6	.6
Year-----	73.9	49.7	61.8	105	4	5,251	48.66	41.35	55.63	69	4.5

[1]Recorded in the period 1951-74 at Conway, Ark.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 22	April 1	April 17
2 years in 10 later than--	March 15	March 28	April 12
5 years in 10 later than--	February 28	March 20	April 3
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 27	October 18
2 years in 10 earlier than--	November 9	October 31	October 22
5 years in 10 earlier than--	November 20	November 6	October 30

[1]Recorded in the period 1951-74 at Conway, Ark.

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24 F	Higher than 28 F	Higher than 32 F
	Days	Days	Days
9 years in 10	239	217	193
8 years in 10	248	222	198
5 years in 10	265	231	209
2 years in 10	282	240	219
1 year in 10	291	245	225

[1]Recorded in the period 1951-74 at Conway, Ark.

TABLE 4.--ACREAGE OF PRINCIPAL CROPS HARVESTED IN 1973

Crops	Acres
Soybeans	10,000
Cotton	300
Rice	1,200
Wheat	1,400
Sorghum	1,900

TABLE 5.--NUMBER OF LIVESTOCK FOR STATED YEARS

Livestock	Number in 1974	Number in 1975
All cattle and calves	48,700	58,900
Milk cows	4,700	5,100
Hogs and pigs	900	1,000

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Acadia silt loam	879	0.2
2	Amy soils, frequently flooded	8,673	2.1
3	Enders gravelly fine sandy loam, 3 to 8 percent slopes	5,127	1.2
4	Enders gravelly fine sandy loam, 8 to 12 percent slopes	9,641	2.3
5	Enders gravelly fine sandy loam, 12 to 45 percent slopes	10,651	2.6
6	Gallion silt loam	1,816	0.4
7	Gallion silt loam, occasionally flooded	152	([1])
8	Leadvale silt loam, 1 to 3 percent slopes	76,754	18.7
9	Leadvale silt loam, 3 to 8 percent slopes	8,522	2.1
10	Linker fine sandy loam, 1 to 3 percent slopes	12,267	3.0
11	Linker fine sandy loam, 3 to 8 percent slopes	82,088	20.1
12	Linker fine sandy loam, 8 to 12 percent slopes	8,425	2.1
13	Linker-Mountainburg association, rolling	3,786	0.9
14	Linker-Mountainburg association, hilly	9,166	2.2
15	McKamie silty clay loam, 3 to 8 percent slopes, severely eroded	708	0.2
16	Moreland silty clay	10,554	2.6
17	Mountainburg gravelly fine sandy loam, 3 to 8 percent slopes	23,420	5.7
18	Mountainburg gravelly fine sandy loam, 8 to 12 percent slopes	12,931	3.2
19	Mountainburg very stony fine sandy loam, 8 to 12 percent slopes	14,300	3.5
20	Mountainburg very stony fine sandy loam, 12 to 40 percent slopes	40,889	10.0
21	Muskogee silt loam, 1 to 3 percent slopes	1,041	0.3
22	Muskogee silty clay loam, 3 to 8 percent slopes, severely eroded	878	0.2
23	Ouachita silt loam, occasionally flooded	6,769	1.6
24	Perry clay, occasionally flooded	8,213	2.0
25	Pickwick silt loam, 1 to 3 percent slopes	1,203	0.3
26	Pickwick silt loam, 3 to 8 percent slopes, eroded	524	0.1
27	Roxana very fine sandy loam	1,961	0.5
28	Roxana very fine sandy loam, occasionally flooded	1,374	0.3
29	Sallisaw gravelly sandy loam, 3 to 8 percent slopes	225	0.1
30	Sallisaw gravelly sandy loam, 8 to 12 percent slopes	410	0.1
31	Spadra fine sandy loam, 1 to 3 percent slopes	4,299	1.0
32	Taft silt loam, 0 to 2 percent slopes	40,689	9.9
33	Yorktown silty clay	1,636	0.4
	Water	333	0.1
	Total	410,304	100.0

[1]Less than 0.1 percent.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1975. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Cotton lint	Soybeans	Rice	Wheat	Bahiagrass	Improved bermudagrass	Tall fescue
	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]	AUM[1]
Acadia:							
1	400	30	120	---	6.0	8.0	6.0
Amy:							
2	---	---	---	---	7.0	---	5.0
Enders:							
3	---	---	---	25	5.0	---	4.0
4	---	---	---	---	---	---	5.0
5	---	---	---	---	---	---	4.0
Gallion:							
6	875	40	---	---	8.0	15.0	8.0
7	825	40	---	---	8.0	15.0	8.0
Leadvale:							
8	500	30	---	40	7.0	9.0	6.0
9	475	25	---	35	5.0	8.0	5.0
Linker:							
10	500	25	---	30	6.5	9.0	5.5
11	475	20	---	25	---	---	5.0
12	450	---	---	25	---	---	4.0
[2]13	---	---	---	---	---	---	3.0
[2]14	---	---	---	---	---	---	---
McKamie:							
15	---	---	---	---	5.0	7.0	5.0
Moreland:							
[3]16	625	35	130	---	7.0	10.0	7.5
Mountainburg:							
17	---	---	---	20	5.0	5.0	---
18	---	---	---	---	4.0	4.0	---
19	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---
Muskogee:							
21	---	25	---	30	7.5	10.0	6.0
22	---	20	---	25	6.0	8.0	5.0
Ouachita:							
23	---	35	---	---	7.5	11.0	7.5
Perry:							
24	---	30	130	---	6.0	9.0	7.0
Pickwick:							
25	750	35	---	50	7.0	10.0	6.5
26	700	25	---	45	---	---	---

See footnote at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

Soil name and map symbol	Cotton lint	Soybeans	Rice	Wheat	Bahiagrass	Improved bermudagrass	Tall fescue
	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]	AUM[1]
Roxana:							
27	850	40	---	---	7.0	15.0	8.0
28	800	40	---	---	7.0	15.0	7.0
Sallisaw:							
29	---	---	---	20	7.0	7.0	7.0
30	---	---	---	---	---	6.0	---
Spadra:							
31	---	30	---	40	---	---	9.0
Taft:							
32	450	25	---	30	6.0	8.0	6.0
Yorktown:							
33	---	---	---	---	---	---	---

[1]Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

[2]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

[3]Yields are for areas protected from flooding.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Acadia:							
1	3w8	Slight	Moderate	Slight	Shortleaf pine Sweetgum Water oak	70 80 80	Loblolly pine, sweetgum.
Amy:							
2	2w6	Slight	Severe	Severe	Sweetgum Water oak	90 90	Sweetgum[1], eastern cottonwood[1], green ash[1], American sycamore[1], Nuttall oak[1], water oak[1].
Enders:							
3, 4	4o1	Slight	Slight	Slight	Shortleaf pine Eastern redcedar	60 20	Loblolly pine, shortleaf pine, eastern redcedar.
5	4r3	Severe	Severe	Moderate	Eastern redcedar Shortleaf pine	40 60	Loblolly pine, shortleaf pine, eastern redcedar.
Gallion:							
6, 7	2o4	Slight	Slight	Slight	Green ash Cherrybark oak Sweetgum Water oak Pecan American sycamore Eastern cottonwood	80 95 90 90 --- --- 100	Eastern cottonwood, American sycamore, cherybark oak, pecan.
Leadvale:							
8, 9	4o7	Slight	Slight	Slight	Shortleaf pine Southern red oak Eastern redcedar	60 60 45	Loblolly pine, shortleaf pine, eastern redcedar.
Linker:							
10, 11, 12	4o1	Slight	Slight	Slight	Shortleaf pine Southern red oak White oak Eastern redcedar Loblolly pine	60 50 50 40 ---	Shortleaf pine, loblolly pine, eastern redcedar.
[2]13:							
Linker part	4o1	Slight	Slight	Slight	Shortleaf pine Southern red oak White oak Eastern redcedar	60 50 50 40	Shortleaf pine, loblolly pine, eastern redcedar.
Mountainburg part	5d2	Slight	Slight	Moderate	Shortleaf pine Eastern redcedar Loblolly pine	50 30 ---	Shortleaf pine, eastern redcedar, loblolly pine.
[2]14:							
Linker part	4r3	Severe	Severe	Slight	Shortleaf pine Southern red oak White oak Eastern redcedar	60 50 50 40	Shortleaf pine, loblolly pine, eastern redcedar.
Mountainburg part	5x3	Severe	Severe	Moderate	Shortleaf pine Eastern redcedar Loblolly pine	50 30 ---	Shortleaf pine, eastern redcedar, loblolly pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
McKamie:							
15	3c2	Slight	Moderate	Moderate	Shortleaf pine	70	Shortleaf pine.
Moreland:							
16	2w6	Slight	Severe	Moderate	Green ash	70	Eastern cottonwood, American sycamore, sweetgum, green ash.
					Eastern cottonwood	90	
					Sweetgum	90	
					American sycamore	---	
					Water oak	90	
Mountainburg:							
17, 18	5d2	Slight	Slight	Moderate	Shortleaf pine	50	Shortleaf pine, eastern redcedar, loblolly pine.
					Eastern redcedar	30	
19	5x3	Slight	Severe	Moderate	Shortleaf pine	50	Shortleaf pine, eastern redcedar, loblolly pine.
					Eastern redcedar	30	
20	5x3	Severe	Severe	Moderate	Shortleaf pine	50	Shortleaf pine, eastern redcedar, loblolly pine.
					Eastern redcedar	30	
Muskogee:							
21, 22	3o7	Slight	Slight	Slight	Shortleaf pine	70	Loblolly pine, shortleaf pine, eastern redcedar, sweetgum.
					Sweetgum	80	
					Water oak	---	
					Southern red oak	---	
Ouachita:							
23	1w8	Slight	Moderate	Slight	Sweetgum	90	Loblolly pine, sweetgum, American sycamore, eastern cottonwood, cherrybark oak.
					Eastern cottonwood	100	
Perry:							
24	2w6	Slight	Severe	Moderate	Cherrybark oak	---	Eastern cottonwood, sweetgum, Nuttall oak, water oak.
					Eastern cottonwood	90	
					Green ash	70	
					Sweetgum	90	
					Water oak	90	
					Nuttall oak	90	
Pickwick:							
25, 26	3o7	Slight	Slight	Slight	White oak	70	Black walnut, loblolly pine, shortleaf pine.
					Shortleaf pine	70	
					Loblolly pine	80	
					Southern red oak	70	
Roxana:							
27, 28	1o4	Slight	Slight	Slight	Eastern cottonwood	115	Eastern cottonwood, American sycamore, sweetgum, cherrybark oak.
					Sweetgum	100	
					Pecan	---	
					American sycamore	---	
					Water oak	---	
Sallisaw:							
29, 30	3o7	Slight	Slight	Slight	Shortleaf pine	70	Shortleaf pine, loblolly pine, black walnut, cherrybark oak.
					Southern red oak	70	
					White oak	60	
Spadra:							
31	2o7	Slight	Slight	Slight	Shortleaf pine	80	Loblolly pine, shortleaf pine, black walnut, black locust, southern red oak, eastern redcedar.
					Southern red oak	80	
					Eastern redcedar	60	

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Taft:							
32	3w8	Slight	Moderate	Moderate	Loblolly pine	---	Loblolly pine, sweetgum, shortleaf pine, southern red oak.
					Sweetgum	80	
					Shortleaf pine	70	
Yorktown:							
33	4w9	Slight	Severe	Severe	Baldcypress	70	Baldcypress, water tupelo.
					Water tupelo	---	
					Water hickory	---	
					Green ash	---	

[1]Planting not recommended without adequate surface drainage.
[2]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 9.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Soils not listed are not in range sites; such soils can be used for grazing if grass cover is established]

Soil name and map symbol	Range site name	Kind of year	Dry weight	Characteristic vegetation
			Lb/acre	
Enders:				
3, 4, 5	Clay Break Shale	Favorable Normal Unfavorable	5,000 3,750 2,500	Little bluestem, indiangrass, Canada wildrye, big bluestem, Virginia tephrosia, native lespedeza, catclaw sensitivebrier, broomsedge, ragweed.
Linker:				
10, 11, 12	Loamy Upland	Favorable Normal Unfavorable	5,000 4,000 3,000	Little bluestem, big bluestem, indiangrass, beaked panicum, native lespedeza, perennial sunflower, broomsedge, ragweed.
13, 14:				
Linker part	Loamy Upland	Favorable Normal Unfavorable	5,000 4,000 3,000	Little bluestem, big bluestem, indiangrass, beaked panicum, native lespedeza, perennial sunflower, broomsedge, ragweed.
Mountainburg part	Sandstone Ridge	Favorable Normal Unfavorable	4,800 3,400 2,000	Little bluestem, indiangrass, big bluestem, Canada wildrye, switchgrass, sunflower, native lespedeza, Virginia tephrosia, tickclovers, New Jersey tea, skunkbush sumac, hidden dropseed, Carolina jointtail, ragweed.
Mountainburg:				
17, 18, 19, 20	Sandstone Ridge	Favorable Normal Unfavorable	4,800 3,400 2,000	Little bluestem, indiangrass, big bluestem, Canada wildrye, switchgrass, sunflower, native lespedeza, Virginia tephrosia, tickclovers, New Jersey tea, skunkbush sumac, hidden dropseed, Carolina jointtail, ragweed.

TABLE 10.--BUILDING SITE DEVELOPMENT

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Acadia:					
1	Severe: wetness, too clayey.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, low strength.
Amy:					
2	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Enders:					
3	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
4	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
5	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
Gallion:					
6	Slight	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.
7	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Leadvale:					
8	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: low strength.	Moderate: low strength.
9	Moderate: slope, wetness.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.
Linker:					
10, 11	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.
12	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: slope, depth to rock.
[1]13:					
Linker part	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: slope, depth to rock.
Mountainburg part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.
[1]14:					
Linker part	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Linker:					
[1]14:					
Mountainburg part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.
McKamie:					
15	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Moreland:					
16	Severe: wetness, too clayey.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.	Severe: shrink-swell, low strength.
Mountainburg:					
17	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
18	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.
19	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.
20	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.
Muskogee:					
21, 22	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Ouachita:					
23	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Perry:					
24	Severe: wetness, too clayey, floods.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: wetness, shrink-swell, floods.
Pickwick:					
25	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
26	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
Roxana:					
27	Slight	Slight	Moderate: wetness.	Slight	Moderate: low strength.
28	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Sallisaw:					
29	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Sallisaw:					
30	Moderate: slope.	Moderate: low strength, slope.	Moderate: low strength, slope.	Severe: slope.	Moderate: low strength, slope.
Spadra:					
31	Slight	Slight	Slight	Slight	Moderate: low strength.
Taft:					
32	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Yorktown:					
33	Severe: floods, wetness, too clayey.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 11.--SANITARY FACILITIES

[Some of the terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Acadia:					
1	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.
Amy:					
2	Severe: floods, percs slowly, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Enders:					
3	Severe: percs slowly.	Moderate: slope, depth to rock.	Severe: depth to rock, too clayey.	Slight	Poor: too clayey.
4	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey.
5	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: slope, too clayey.
Gallion:					
6	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
7	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
Leadvale:					
8	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey, wetness.	Slight	Fair: too clayey, hard to pack.
9	Severe: percs slowly, slope.	Severe: slope.	Moderate: too clayey, wetness.	Moderate: slope.	Fair: slope, hard to pack.
Linker:					
10, 11	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Fair: thin layer.
12	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: slope, thin layer.
[1]13:					
Linker part	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: slope, thin layer.
Mountainburg part	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
[1]14:					
Linker part	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Linker:					
[1]14:					
Mountainburg part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, large stones.
McKamie:					
15	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Moreland:					
16	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.
Mountainburg:					
17	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
18	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
19	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: seepage.	Poor: thin layer. large stones.
20	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, large stones.
Muskogee:					
21, 22	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Fair: thin layer, too clayey.
Ouachita:					
23	Severe: floods, percs slowly.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
Perry:					
24	Severe: percs slowly, wetness, floods.	Severe: floods.	Severe: wetness, too clayey, floods.	Severe: wetness, floods.	Poor: wetness, too clayey.
Pickwick:					
25	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
26	Slight	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
Roxana:					
27	Slight	Moderate: seepage.	Slight	Slight	Good.
28	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Good.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sallisaw:					
29	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
30	Moderate: slope.	Severe: slope, seepage.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
Spadra:					
31	Slight	Moderate: seepage.	Slight	Slight	Good.
Taft:					
32	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Yorktown:					
33	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 12.--WATER MANAGEMENT

["Seepage" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not evaluated]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Acadia:						
1	Slight	Moderate: compressible, low strength, shrink-swell.	Percs slowly	Slow intake	Not needed	Favorable.
Amy:						
2	Slight	Moderate: compressible, low strength, piping.	Floods, percs slowly, wetness.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
Enders:						
3, 4, 5	Moderate: depth to rock.	Severe: low strength, compressible.	Not needed	Slope, erodes easily, slow intake.	Slope, depth to rock, erodes easily.	Erodes easily, percs slowly, slope.
Gallion:						
6	Moderate: seepage.	Slight	Not needed	Favorable	Not needed	Favorable.
7	Moderate: seepage.	Slight	Not needed	Floods	Not needed	Favorable.
Leadvale:						
8	Slight	Moderate: piping.	Percs slowly	Favorable	Favorable	Favorable.
9	Slight	Moderate: piping.	Percs slowly	Favorable	Slope	Favorable.
Linker:						
10, 11, 12	Severe: depth to rock.	Moderate: thin layer, compressible.	Not needed	Slope, erodes easily.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
[1]13:						
Linker part	Severe: depth to rock.	Moderate: thin layer, compressible.	Not needed	Slope, erodes easily.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
Mountainburg part	Severe: depth to rock, seepage.	Severe: thin layer.	Not needed	Slope, fast intake, rooting depth.	Slope, depth to rock, rooting depth.	Rooting depth, slope.
[1]14:						
Linker part	Severe: depth to rock.	Moderate: thin layer, compressible.	Not needed	Slope, erodes easily.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
Mountainburg part	Severe: depth to rock, seepage.	Severe: thin layer.	Not needed	Slope, fast intake, rooting depth.	Slope, depth to rock, rooting depth.	Rooting depth, slope.
McKamie:						
15	Slight	Moderate: shrink-swell, low strength, compressible.	Not needed	Slope, erodes easily, slow intake.	Slope, erodes easily, percs slowly.	Slope.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Moreland:						
16	Slight	Moderate: compressible, low strength, shrink-swell.	Complex slope, percs slowly.	Complex slope, slow intake.	Not needed	Favorable.
Mountainburg:						
17, 18, 19, 20	Severe: depth to rock, seepage.	Severe: thin layer.	Not needed	Slope, fast intake, rooting depth.	Slope, depth to rock, rooting depth.	Rooting depth, slope.
Muskogee:						
21	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slope, slow intake.	Favorable	Favorable.
22	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slope, slow intake.	Favorable	Erodes easily, percs slowly, slope.
Ouachita:						
23	Moderate: seepage.	Moderate: compressible, piping.	Not needed	Favorable	Not needed	Not needed.
Perry:						
24	Slight	Moderate: shrink-swell, low strength, compressible.	Floods, percs slowly.	Floods, slow intake, wetness.	Not needed	Wetness.
Pickwick:						
25	Moderate: seepage.	Slight	Not needed	Favorable	Favorable	Slope.
26	Moderate: seepage.	Slight	Not needed	Slope	Slope	Slope.
Roxana:						
27	Moderate: seepage.	Moderate: erodes easily, seepage, piping.	Not needed	Favorable	Not needed	Erodes easily.
28	Moderate: seepage.	Moderate: erodes easily, seepage, piping.	Not needed	Floods	Not needed	Erodes easily.
Sallisaw:						
29, 30	Moderate: seepage.	Moderate: thin layer, low strength.	Not needed	Slope	Slope	Slope.
Spadra:						
31	Moderate: seepage.	Moderate: piping, compressible.	Not needed	Slope	Slope	Slope.
Taft:						
32	Slight	Moderate: compressible, piping.	Percs slowly, poor outlets.	Wetness	Not needed	Not needed.
Yorktown:						
33	Slight	Moderate: shrink-swell, low strength.	Floods, wetness.	Floods, slow intake, wetness.	Not needed	Not needed.

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 13.--CONSTRUCTION MATERIALS

["Shrink-swell" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Acadia:				
1	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Amy:				
2	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Enders:				
3, 4, 5	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, small stones.
Gallion:				
6, 7	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Leadvale:				
8, 9	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
Linker:				
10, 11	Fair: low strength, thin layer.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
12	Fair: low strength, thin layer.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
[1]13:				
Linker part	Fair: low strength, thin layer.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
Mountainburg part	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: thin layer, small stones.
[1]14:				
Linker part	Fair: low strength, thin layer.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope.
Mountainburg part	Poor: slope, thin layer, large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, thin layer, large stones.
McKamie:				
15	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Moreland:				
16	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Mountainburg:				
17, 18	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: thin layer, small stones.
19	Poor: thin layer, large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: thin layer, large stones.
20	Poor: slope, thin layer, large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, thin layer, large stones.
Muskogee:				
21, 22	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, too clayey.
Ouachita:				
23	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Perry:				
24	Poor: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Pickwick:				
25	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
26	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer,
Roxana:				
27, 28	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Sallisaw:				
29	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
30	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
Spadra:				
31	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Taft:				
32	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Yorktown:				
33	Poor: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Acadia:											
1-----------------	0-12	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	85-100	<30	NP-7
	12-18	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	85-100	30-40	11-18
	18-54	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	90-100	42-70	20-43
	54-78	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	85-100	35-65	15-38
Amy:											
2-----------------	0-12	Silt loam--------	ML, CL-ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	12-40	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
	40-60	Fine sandy loam, silt loam, silty clay loam.	ML, SM, CL-ML, CL	A-4, A-6	0	100	95-100	80-95	40-90	<35	NP-20
Enders:											
3, 4, 5-----------	0-3	Gravelly fine sandy loam.	ML, SC, CL, CL-ML	A-2, A-4	0-15	50-95	35-75	30-70	30-60	25-35	4-10
	3-8	Clay loam, silty clay loam, loam.	CL, ML	A-6	0	80-100	80-100	80-100	75-95	30-40	11-15
	8-32	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	32-56	Silty clay, stony silty clay, clay.	CH	A-7	0-15	95-100	90-100	85-100	70-95	65-80	35-45
	56-86	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Gallion:											
6, 7--------------	0-8	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	100	90-100	<28	NP-11
	8-64	Silt loam, silty clay loam, clay loam.	CL	A-6	0	100	100	100	90-100	28-40	11-17
	64-81	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	100	90-100	23-34	4-19
Leadvale:											
8, 9--------------	0-26	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	85-95	65-85	18-32	2-10
	26-64	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6, A-7	0	100	95-100	80-98	70-90	24-42	5-18
	64-73	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	100	95-100	80-98	70-90	24-42	5-18
Linker:											
10, 11, 12--------	0-14	Fine sandy loam	SM, ML, CL-ML	A-2, A-4	0-5	65-100	60-100	55-100	25-70	<30	NP-7
	14-37	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Linker:											
[1]13:											
Linker part-----	0-14	Fine sandy loam	SM, ML, CL-ML	A-2, A-4	0-5	65-100	60-100	55-100	25-70	<30	NP-7
	14-37	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mountainburg part-----------	0-8	Gravelly fine sandy loam.	GM	A-1, A-2	5-15	30-50	25-50	20-40	15-30	---	NP
	8-13	Very stony sandy clay loam, very stony loam, very stony fine sandy loam.	GM, GC, GM-GC	A-1, A-2	15-30	40-60	35-55	25-50	10-30	<30	NP-10
	13-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
[1]14:											
Linker part-----	0-14	Fine sandy loam	SM, ML, CL-ML	A-2, A-4	0-5	65-100	60-100	55-100	25-70	<30	NP-7
	14-37	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mountainburg part-----------	0-11	Very stony fine sandy loam.	GM	A-1, A-2	30-65	40-50	30-50	20-40	15-25	<20	NP
	11-16	Very stony sandy clay loam, very stony loam, very stony fine sandy loam.	GM, GC, GM-GC	A-1, A-2	15-30	40-60	35-55	25-50	10-30	<30	NP-10
	16-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
McKamie:											
15----------------	0-2	Silty clay loam	CL	A-6	0	100	100	95-100	95-100	25-40	11-18
	2-72	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-100	45-70	22-40
Moreland:											
16----------------	0-4	Silty clay------	CH	A-7	0	100	95-100	90-100	90-100	51-74	25-45
	4-76	Clay, silty clay loam, silty clay.	CH, CL	A-7, A-6	0	100	100	100	90-100	35-74	15-45
Mountainburg:											
17, 18------------	0-8	Gravelly fine sandy loam.	GM	A-1, A-2	5-15	30-50	25-50	20-40	15-30	---	NP
	8-13	Very stony sandy clay loam, very stony loam, very stony fine sandy loam.	GM, GC, GM-GC	A-1, A-2	15-30	40-60	35-55	25-50	10-30	<30	NP-10
	13-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Mountainburg: 19, 20	0-11	Very stony fine sandy loam.	GM	A-1, A-2	30-65	40-50	30-50	20-40	15-25	<20	NP
	11-16	Very stony sandy clay loam, very stony loam, very stony fine sandy loam.	GM, GC, GM-GC	A-1, A-2	15-30	40-60	35-55	25-50	10-30	<30	NP-10
	16-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Muskogee: 21	0-5	Silt loam	ML, CL, CL-ML	A-4	0	100	100	95-100	85-100	18-30	1-10
	5-20	Silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	95-100	90-100	35-55	15-30
	20-78	Silty clay, clay	CH	A-7	0	100	100	95-100	90-100	55-70	30-40
22	0-5	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	90-100	35-55	15-30
	5-20	Silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	95-100	90-100	35-55	15-30
	20-78	Silty clay, clay	CH	A-7	0	100	100	95-100	90-100	55-70	30-40
Ouachita: 23	0-16	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	16-76	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
Perry: 24	0-29	Clay	CH, CL	A-7	0	100	100	100	95-100	45-75	22-45
	29-67	Clay	CH	A-7	0	100	100	100	95-100	60-80	33-50
Pickwick: 25, 26	0-4	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	70-95	18-32	2-11
	4-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	95-100	95-100	90-100	75-95	30-42	11-17
	32-67	Silty clay loam, clay loam, clay.	CL, ML, MH	A-6, A-7	0-5	80-100	75-100	65-95	55-80	33-52	12-22
Roxana: 27, 28	0-75	Very fine sandy loam.	ML, CL-ML	A-4	0	100	100	85-100	50-75	<27	NP-7
Sallisaw: 29, 30	0-12	Gravelly sandy loam.	SC-SM, SM, SC	A-2, A-4	0-5	55-100	51-100	45-70	25-50	<27	NP-10
	12-72	Gravelly sandy clay loam.	SC, SM-SC	A-2, A-4, A-6	0	60-85	50-75	35-60	20-50	23-28	7-18
Spadra: 31	0-7	Fine sandy loam	ML, SM	A-2, A-4	0	85-100	80-100	65-80	30-75	<20	NP-3
	7-73	Loam, sandy clay loam.	CL, ML	A-4, A-6	0	90-100	90-100	80-95	55-75	25-40	8-15
Taft: 32	0-24	Silt loam, silty clay loam.	CL-ML, ML, CL	A-4	0	100	95-100	90-100	75-95	18-30	2-7
	24-42	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	95-100	90-100	85-100	80-95	23-42	5-20
	42-76	Silty clay loam, clay, cherty silty clay loam.	MH, ML, SC, CL	A-6, A-7	0-20	65-100	55-100	45-90	36-85	35-65	12-30

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Yorktown:											
33	0-50	Silty clay, clay	MH, CH, OH	A-7	0	100	100	100	95-100	55-75	22-45
	50-60	Clay	CH	A-7	0	100	100	100	95-100	60-80	32-50

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 15.--RECREATIONAL DEVELOPMENT

[Some of the terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Acadia:				
1	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
Amy:				
2	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.
Enders:				
3	Severe: percs slowly.	Slight	Severe: percs slowly.	Slight.
4	Severe: percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight.
5	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, percs slowly.	Severe: slope.
Gallion:				
6	Slight	Slight	Slight	Slight.
7	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
Leadvale:				
8	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
9	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Linker:				
10, 11	Slight	Slight	Moderate: slope.	Slight.
12	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
[1]13:				
Linker part	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Mountainburg part	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope, depth to rock, small stones.	Moderate: small stones, slope.
[1]14:				
Linker part	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Mountainburg part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.

See footnote at end of table.

TABLE 15.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
McKamie:				
15	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Moreland:				
16	Severe: too clayey, percs slowly, wetness.	Severe: too clayey, wetness.	Severe: too clayey, percs slowly, wetness.	Severe: too clayey, wetness.
Mountainburg:				
17	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: depth to rock, small stones.	Moderate: small stones, slope.
18	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope, depth to rock, small stones.	Moderate: small stones, slope.
19	Severe: large stones.	Severe: large stones.	Severe: slope, depth to rock, large stones.	Severe: large stones.
20	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.
Muskogee:				
21	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
22	Moderate: percs slowly, too clayey.	Moderate: too clayey.	Moderate: slope, percs slowly.	Moderate: too clayey.
Ouachita:				
23	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
Perry:				
24	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.
Pickwick:				
25	Slight	Slight	Moderate: slope.	Slight.
26	Slight	Slight	Moderate: slope.	Slight.
Roxana:				
27	Slight	Slight	Slight	Slight.
28	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
Sallisaw:				
29	Slight	Slight	Moderate: slope.	Slight.
30	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

TABLE 15.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Spadra: 31	Slight	Slight	Moderate: slope.	Slight.
Taft: 32	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
Yorktown: 33	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 16.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Acadia:												
1	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Amy:												
2	Poor	Fair	Fair	Fair	Fair	---	Good	---	Fair	Good	Fair	---
Enders:												
3, 4	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
5	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Gallion:												
6, 7	Good	Good	Good	Good	---	---	Poor	Very poor.	Good	Good	Very poor.	---
Leadvale:												
8	Fair	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
9	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
Linker:												
10, 11	Fair	Good	Good	---	---	---	Poor	Very poor.	Good	Good	Very poor.	---
12	Fair	Good	Good	---	---	---	Very poor.	Very poor.	Good	Good	Very poor.	---
[1]13:												
Linker part	Fair	Good	Good	---	---	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Mountainburg part	Very poor.	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---
[1]14:												
Linker part	Poor	Fair	Good	---	---	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Mountainburg part	Very poor.	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---
McKamie:												
15	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Moreland:												
16	Fair	Fair	Fair	Good	---	---	Good	Good	Fair	Good	Good	---
Mountainburg:												
17	Poor	Poor	Poor	Very poor.	Very poor.	---	Poor	Very poor.	Poor	Very poor.	Very poor.	---
18, 19, 20	Very poor.	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---
Muskogee:												
21	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---

See footnote at end of table.

TABLE 16.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Muskogee:												
22	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Ouachita:												
23	Good	Good	Good	Good	Good	---	Good	Fair	Good	Good	Fair	---
Perry:												
24	Poor	Fair	Fair	Fair	---	---	Poor	Good	Fair	Fair	Fair	---
Pickwick:												
25	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	---
26	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
Roxana:												
27, 28	Good	Good	Good	Good	---	---	Poor	Very poor.	Good	Good	Very poor.	---
Sallisaw:												
29	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
30	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Spadra:												
31	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Taft:												
32	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	---
Yorktown:												
33	Very poor.	Very poor.	Very poor.	Poor	Poor	---	Poor	Good	Very poor.	Very poor.	Fair	---

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[Dashes indicate data were not available. The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Risk of corrosion		Erosion factors	
							Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH	Mmhos/cm					
Acadia:										
1	0-12	0.6-2.0	0.16-0.23	4.5-6.0	<2	Low	High	High	0.43	4
	12-18	0.6-2.0	0.16-0.22	4.5-5.5	<2	Moderate	High	High	0.32	
	18-54	<0.06	0.15-0.18	4.5-6.0	<2	High	High	High	0.32	
	54-78	<0.2	0.15-0.20	4.5-7.8	<2	High	High	Low	0.32	
Amy:										
2	0-12	0.6-2.0	0.13-0.24	4.5-5.5	<2	Low	High	Moderate	0.43	5
	12-40	0.06-0.2	0.16-0.24	4.5-5.5	<2	Low	High	Moderate	0.43	
	40-80	0.6-2.0	0.11-0.15	4.5-5.5	<2	Low	High	Moderate	0.43	
Enders:										
3, 4, 5	0-3	0.6-2.0	0.07-0.15	3.6-5.5	<2	Low	Low	Moderate	0.32	3
	3-8	0.2-0.6	0.15-0.22	3.6-5.5	<2	Low	Moderate	High	0.43	
	8-32	<0.06	0.12-0.18	3.6-5.5	<2	High	High	High	0.37	
	32-56	<0.06	0.08-0.10	3.6-5.5	<2	Moderate	High	High	0.37	
	56-86	---	---	---	---	---------	---------	---------	---	
Gallion:										
6, 7	0-8	0.6-2.0	0.21-0.23	5.6-7.3	<2	Low	Low	Low	0.37	5
	8-64	0.6-2.0	0.20-0.22	5.6-8.4	<2	Moderate	Moderate	Low	0.32	
	64-81	0.6-2.0	0.20-0.23	6.1-8.4	<2	Low	Low	Low	0.37	
Leadvale:										
8, 9	0-26	0.6-2.0	0.17-0.22	4.5-5.5	<2	Low	Moderate	Moderate	0.43	3
	26-64	0.2-0.6	0.06-0.11	4.5-5.5	<2	Low	Moderate	Moderate	0.24	
	64-73	0.2-0.6	0.06-0.11	4.5-5.5	<2	Low	Moderate	Moderate	0.24	
Linker:										
10, 11, 12	0-14	0.6-2.0	0.11-0.17	3.6-5.5	<2	Low	Low	High	0.24	3
	14-37	0.6-2.0	0.11-0.20	3.6-5.5	<2	Low	Low	High	0.24	
	37-39	---	---	---	---	---------	---------	---------	---	
[1]13:										
Linker part	0-14	0.6-2.0	0.11-0.17	3.6-5.5	<2	Low	Low	High	0.24	3
	14-37	0.6-2.0	0.11-0.20	3.6-5.5	<2	Low	Low	High	0.24	
	37-39	---	---	---	---	---------	---------	---------	---	
Mountainburg part	0-8	2.0-6.0	0.05-0.10	5.1-6.0	<2	Low	Low	Moderate	0.17	1
	8-13	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low	Low	Moderate	0.24	
	13-18	---	---	---	---	---------	---------	---------	---	
[1]14:										
Linker part	0-14	0.6-2.0	0.11-0.17	3.6-5.5	<2	Low	Low	High	0.24	3
	14-37	0.6-2.0	0.11-0.20	3.6-5.5	<2	Low	Low	High	0.24	
	37-39	---	---	---	---	---------	---------	---------	---	
Mountainburg part	0-11	2.0-6.0	0.05-0.10	5.1-6.0	<2	Low	Low	Moderate	0.17	1
	11-16	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low	Low	Moderate	0.24	
	16-18	---	---	---	---	---------	---------	---------	---	
McKamie:										
15	0-2	0.6-2.0	0.16-0.22	5.1-6.5	<2	Moderate	Moderate	Moderate	0.37	2
	2-72	<0.06	0.18-0.20	4.5-7.8	<2	High	High	Moderate	0.32	
Moreland:										
16	0-4	<0.06	0.18-0.20	6.1-7.8	<2	Very high	High	Low	0.32	5
	4-76	<0.06	0.18-0.21	6.6-8.4	<2	Very high	High	Low	0.32	
Mountainburg:										
17, 18	0-8	2.0-6.0	0.05-0.10	5.1-6.0	<2	Low	Low	Moderate	0.17	1
	8-13	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low	Low	Moderate	0.24	
	13-18	---	---	---	---	---------	---------	---------	---	

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors	
							Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH	Mmhos/cm					
Mountainburg:										
19, 20	0-11	2.0-6.0	0.05-0.10	5.1-6.0	<2	Low	Low	Moderate	0.17	1
	11-16	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low	Low	Moderate	0.24	
	16-18	---	---	---	---	---------	---------	---------	---	
Muskogee:										
21	0-5	0.6-2.0	0.16-0.24	4.5-6.0	<2	Low	Moderate	Moderate	0.43	5
	5-20	0.2-0.6	0.16-0.24	4.5-6.0	<2	Moderate	High	Moderate	0.37	
	20-78	0.06-0.2	0.14-0.18	4.5-7.8	<2	High	High	Moderate	0.32	
22	0-20	0.2-0.6	0.18-0.22	4.5-6.0	<2	Moderate	High	Moderate	0.37	5
	20-78	0.06-0.2	0.14-0.18	4.5-7.8	<2	High	High	Moderate	0.32	
Ouachita:										
23	0-16	0.6-2.0	0.15-0.24	4.5-6.0	<2	Low	Low	Moderate	0.37	5
	16-76	0.2-0.6	0.15-0.24	4.5-5.5	<2	Low	Moderate	Moderate	0.32	
Perry:										
24	0-29	<0.06	0.17-0.20	4.5-6.0	<2	High	High	Moderate	0.24	5
	29-67	<0.06	0.17-0.20	5.1-8.4	<2	High	High	Low	0.28	
Pickwick:										
25, 26	0-4	0.6-2.0	0.20-0.22	4.5-5.5	<2	Low	Moderate	Moderate	0.43	5
	4-32	0.6-2.0	0.17-0.20	4.5-5.5	<2	Low	Moderate	Moderate	0.37	
	32-67	0.6-2.0	0.12-0.17	4.5-5.5	<2	Moderate	Moderate	Moderate	0.37	
Roxana:										
27, 28	0-75	0.6-2.0	0.10-0.21	6.1-8.4	<2	Low	Low	Low	0.37	5
Sallisaw:										
29, 30	0-12	0.6-2.0	0.10-0.18	5.6-6.5	<2	Low	Low	Low	0.32	4
	12-72	0.6-2.0	0.06-0.10	4.5-6.0	<2	Low	Moderate	Moderate	0.24	
Spadra:										
31	0-7	0.6-2.0	0.11-0.24	4.5-5.5	<2	Low	Low	High	0.37	5
	7-73	0.6-2.0	0.12-0.20	4.5-5.5	<2	Low	Low	High	0.37	
Taft:										
32	0-24	0.6-2.0	0.20-0.22	4.5-5.5	<2	Low	High	High	0.43	3
	24-42	0.06-0.2	0.03-0.07	4.5-5.5	<2	Low	High	High	0.43	
	42-76	0.2-0.6	0.01-0.03	4.5-5.5	<2	Low	High	High	0.37	
Yorktown:										
33	0-50	<0.06	0.12-0.18	5.6-7.3	<2	High	High	Moderate	0.32	5
	50-60	<0.06	0.12-0.18	5.6-7.8	<2	Very high	High	Moderate	0.32	

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 18.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness
					Ft			In		In	
Acadia:											
1	D	None	---	---	0.5-1.5	Perched	Dec-Apr	>60	---	---	---
Amy:											
2	D	Frequent	Brief to very long.	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	---	---
Enders:											
3, 4, 5	C	None	---	---	>6.0	---	---	40-60	Rippable	---	---
Gallion:											
6	B	None	---	---	4.0-6.0	Apparent	Dec-Apr	>60	---	---	---
7	B	Occasional	Brief to long.	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	>60	---	---	---
Leadvale:											
8, 9	C	None	---	---	2.0-3.0	Perched	Jan-Apr	>48	Rippable	---	---
Linker:											
10, 11, 12	B	None	---	---	>6.0	---	---	20-40	Hard	---	---
[1]13:											
Linker part	B	None	---	---	>6.0	---	---	20-40	Hard	---	---
Mountainburg part	D	None	---	---	>6.0	---	---	12-20	Hard	---	---
[1]14:											
Linker part	B	None	---	---	>6.0	---	---	20-40	Hard	---	---
Mountainburg part	D	None	---	---	>6.0	---	---	12-20	Hard	---	---
McKamie:											
15	D	None	---	---	>6.0	---	---	>60	---	---	---
Moreland:											
16	D	None	---	---	0-1.5	Perched	Dec-Apr	>60	---	---	---
Mountainburg:											
17, 18, 19, 20	D	None	---	---	>6.0	---	---	12-20	Hard	---	---
Muskogee:											
21, 22	C	None	---	---	>6.0	---	---	>60	---	---	---
Ouachita:											
23	C	Occasional	Long to very long.	Dec-May	>6.0	---	---	>60	---	---	---
Perry:											
24	D	Occasional	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Apr	>60	---	---	---
Pickwick:											
25, 26	B	None	---	---	>6.0	---	---	>60	---	---	---

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Depth	Hard-ness
					Ft			In		In	
Roxana:											
27	B	None	---	---	4.0-6.0	Apparent	Dec-Apr	>60	---	---	---
28	B	Occasional	Brief to long.	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	>60	---	---	---
Sallisaw:											
29, 30	B	None	---	---	>6.0	---	---	>60	---	---	---
Spadra:											
31	B	None	---	---	>6.0	---	---	>60	---	---	---
Taft:											
32	C	None	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	---	---
Yorktown:											
33	D	Common	Very long	Oct-Aug	+5-0.5	Apparent	Oct-Aug	>60	---	---	---

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole unit.

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS

[The symbol < means less than]

Soil name and sample number	Depth	Horizon	Particle-size distribution (percent less than 2.0 mm): Very coarse sand through medium sand (2.0-0.25 mm)	Fine sand (0.25)-0.10 mm)	Very fine sand (0.10-0.05 mm)	Total sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In							
Moreland silty clay S73-AR-023-3-(1-6)	0-4	Ap	0.4	0.6	1.1	2.1	46.6	51.3
	4-15	B21	0.3	0.6	1.0	1.9	39.6	58.5
	15-25	B22	0.6	0.8	1.0	2.4	43.3	54.3
	25-47	B23	0.5	0.6	0.8	1.9	48.0	50.1
	47-61	B31	0.7	0.7	0.7	2.1	51.3	46.6
	61-76	B32	0.1	0.3	0.6	1.0	42.7	56.3
Ouachita silt loam S73-AR-023-10-(1-5)	0-9	Ap	0.6	7.1	8.2	15.9	68.8	15.3
	9-16	A12	0.5	3.2	6.0	9.7	72.9	17.4
	16-41	B21	0.1	0.7	5.7	6.5	71.9	21.6
	41-63	B22	0.0	1.7	14.7	16.4	69.6	14.0
	63-76	B23	0.1	4.0	24.9	29.0	59.5	11.5
Roxana very fine sandy loam. S72-AR-023-1-(1-5)	0-6	Ap	0.2	7.6	53.5	61.3	32.7	6.0
	6-13	C1	0.0	5.4	58.3	63.7	31.4	4.9
	13-24	C2	0.0	5.2	55.0	60.2	35.6	4.2
	24-52	C3	0.0	4.1	60.5	64.6	31.2	4.2
	52-64	C4	0.1	3.3	62.3	65.7	29.2	5.1
	64-75	C4	0.0	0.2	52.6	52.8	36.7	10.5

TABLE 20.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Extractable acidity	Base saturation	Reaction (1:1 soil) water	Organic matter	Available phosphorus
	In		Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g	Pct	pH	Pct	P/m
Moreland silty clay S73-AR-023-3-(1-6)	0-4	Ap	12.0	7.6	0.2	0.6	12.5	62	6.1	2.7	17
	4-15	B21	15.8	9.0	0.3	0.7	10.5	71	6.6	1.9	17
	15-25	B22	15.2	11.7	0.5	0.6	8.9	76	6.7	1.9	13
	25-47	B23	12.0	10.6	0.9	0.5	7.2	77	6.9	0.9	11
	47-61	B31	10.6	11.4	1.1	0.5	6.1	79	7.1	0.7	11
	61-76	B32	---	---	---	---	---	---	7.4	0.6	16
Ouachita silt loam S73-AR-023-10-(1-5)	0-9	Ap	2.0	0.6	0.2	0.1	8.1	26	5.4	1.5	5
	9-16	A12	2.4	0.7	0.3	0.2	9.2	28	5.6	1.3	4
	16-41	B21	1.3	0.7	0.2	0.2	12.8	16	5.0	0.8	6
	41-63	B22	1.0	0.8	0.2	0.1	10.1	17	5.0	0.6	7
	63-76	B23	1.0	0.8	0.2	0.1	7.9	21	5.0	0.4	10
Roxana very fine sandy loam. S72-AR-023-1-(1-5)	0-6	Ap	2.9	0.4	0.1	0.2	3.5	51	5.8	1.1	80
	6-13	C1	3.2	0.4	0.1	0.2	3.0	57	6.4	0.8	80
	13-24	C2	2.3	0.4	0.1	0.1	3.0	49	6.6	0.3	60
	24-52	C3	2.3	0.5	0.2	0.1	2.4	56	6.9	0.2	51
	52-64	C4	3.1	0.8	0.2	0.1	4.6	48	6.7	0.2	57
	64-75	C4	3.0	1.8	0.2	0.2	6.4	45	5.5	0.2	62

TABLE 21.--MINERALOGY OF SELECTED SOILS

Soil series and sample number	Horizon	Depth from surface	Sand mineralogy[1]: Very fine sand			Sand mineralogy[1]: Coarse silt	Clay mineralogy (x-ray)		
			NW-QZ[2]	MS[3]	FK[4]	NW[5]	VR[6]	MI[7]	KK[8]
		Inches					Amount	Amount	Amount
Ouachita:									
S73AR023-10-2-------------	A12	9-16	[9]98	[9]1	[9]1	[9]96	Small---	Small---	Small.
S73AR023-10-3-------------	B21	16-41	98	1	1	96	Small---	Small---	Small.

[1]Figures expressed as relative amounts in percent of total for very fine sand and for coarse silt.
[2]Nonweatherable quartz.
[3]Muscovite.
[4]Potassium feldspar.
[5]Nonweatherable.
[6]Vermiculite-chlorite.
[7]Mica.
[8]Kaolinite.
[9]Estimate.

TABLE 22.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Acadia---------------------	Fine, montmorillonitic, thermic Aeric Ochraqualfs
Amy------------------------	Fine-silty, siliceous, thermic Typic Ochraquults
Enders---------------------	Clayey, mixed, thermic Typic Hapludults
Gallion--------------------	Fine-silty, mixed, thermic Typic Hapludalfs
Leadvale-------------------	Fine-silty, siliceous, thermic Typic Fragiudults
Linker---------------------	Fine-loamy, siliceous, thermic Typic Hapludults
McKamie--------------------	Fine, mixed, thermic Vertic Hapludalfs
Moreland-------------------	Fine, mixed, thermic Vertic Hapludolls
Mountainburg---------------	Loamy-skeletal, siliceous, thermic Lithic Hapludults
Muskogee-------------------	Fine-silty, mixed, thermic Aquic Paleudalfs
Ouachita-------------------	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Perry----------------------	Very fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
*Pickwick------------------	Fine-silty, mixed, thermic Typic Hapludults
Roxana---------------------	Coarse-silty, mixed, nonacid, thermic Typic Udifluvents
*Sallisaw------------------	Fine-loamy, mixed, thermic Typic Paleudalfs
Spadra---------------------	Fine-loamy, siliceous, thermic Typic Hapludults
Taft-----------------------	Fine-silty, siliceous, thermic Glossaquic Fragiudults
Yorktown-------------------	Very fine, montmorillonitic, nonacid, thermic Typic Fluvaquents

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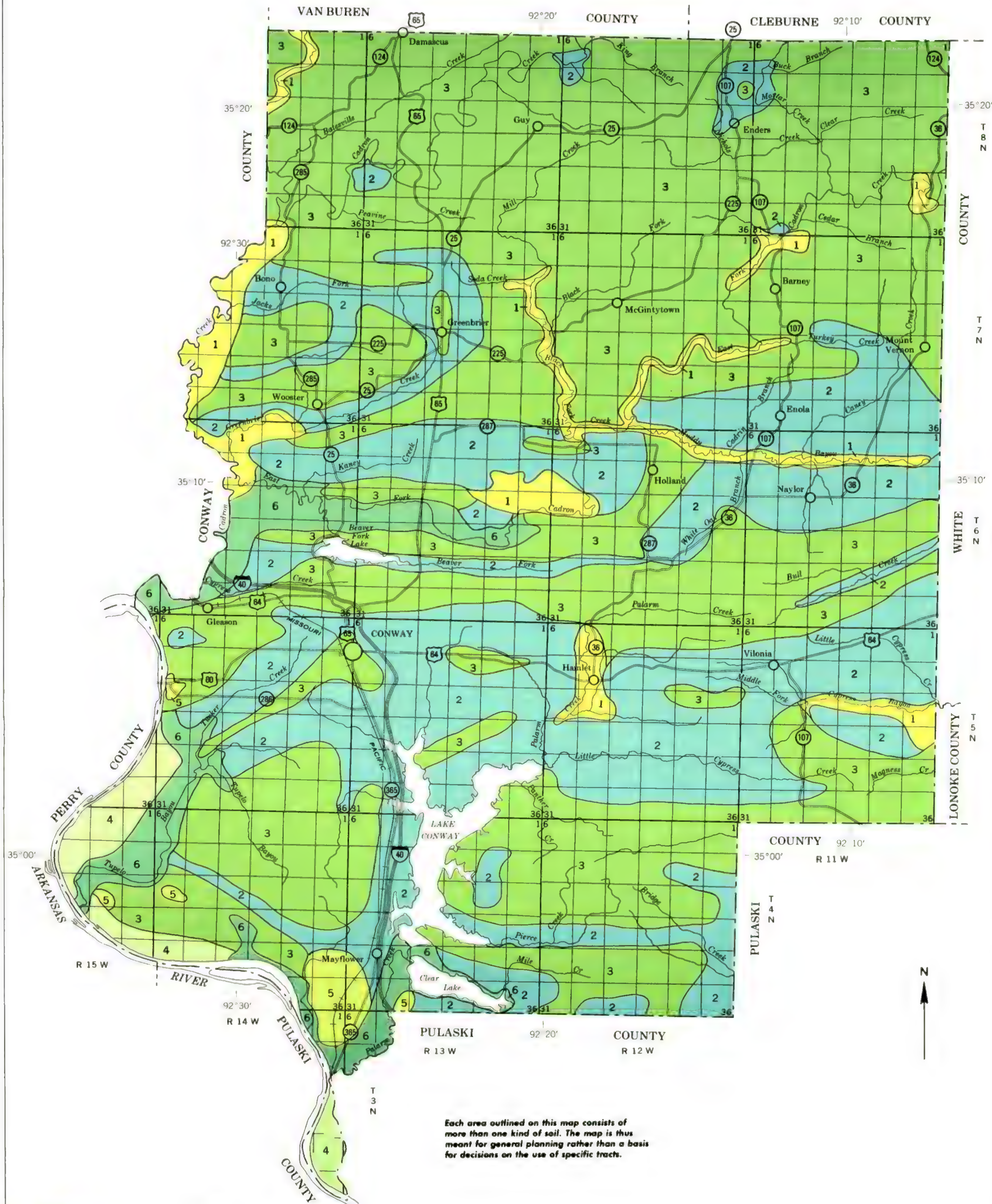


LEGEND

1	SPADRA–OUACHITA–AMY: Well drained and poorly drained, level and nearly level loamy soils on flood plains, natural levees, and terraces.
2	LEADVALE–TAFT: Moderately well drained and somewhat poorly drained, nearly level to gently sloping loamy soils on stream terraces, on benches, and in depressions.
3	LINKER–MOUNTAINBURG: Well drained, nearly level to steep loamy, gravelly and stony soils on benches, ridges, hilltops, and mountaintops.
4	ROXANA–GALLION: Well drained, level and nearly level loamy soils on flood plains, natural levees, and terraces.
5	MUSKOGEE–SALLISAW: Moderately well drained and well drained, nearly level to moderately sloping loamy and gravelly soils on stream and river terraces.
6	MORELAND–PERRY: Poorly drained and somewhat poorly drained, level clayey soils in back swamps of the Arkansas River.

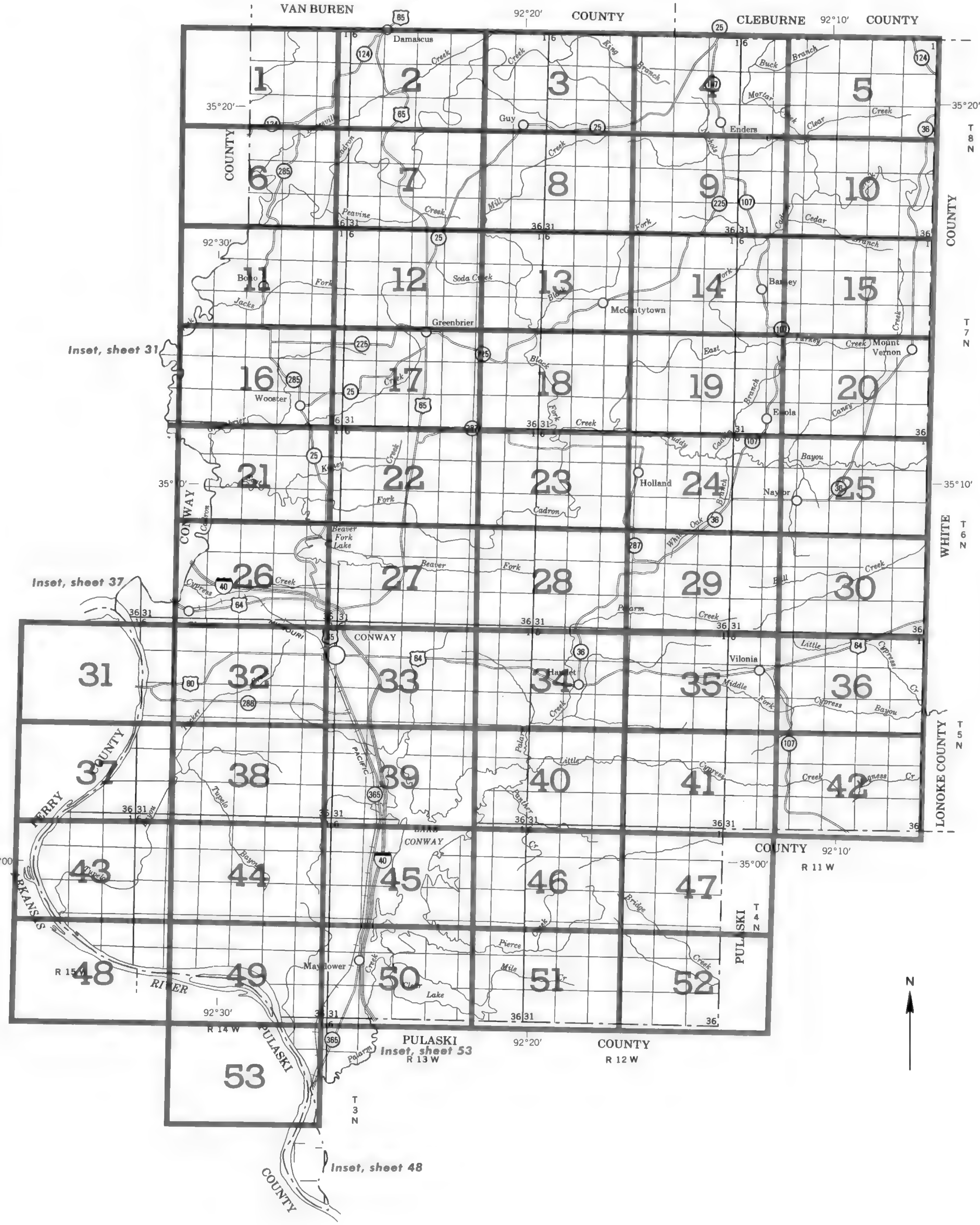
Compiled 1977

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ARKANSAS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
FAULKNER COUNTY, ARKANSAS

Scale 1:190,080

1 0 1 2 3 4 Miles



INDEX TO MAP SHEETS
FAULKNER COUNTY, ARKANSAS

Scale 1:190,080

1 0 1 2 3 4 Miles

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool — Davis Airstrip; FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate — 79
- Federal — 410
- State — 52
- County, farm or ranch — 378

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water; w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — GAS
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water; w
- Intermittent — int; i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CaA; FoB2

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown) — S

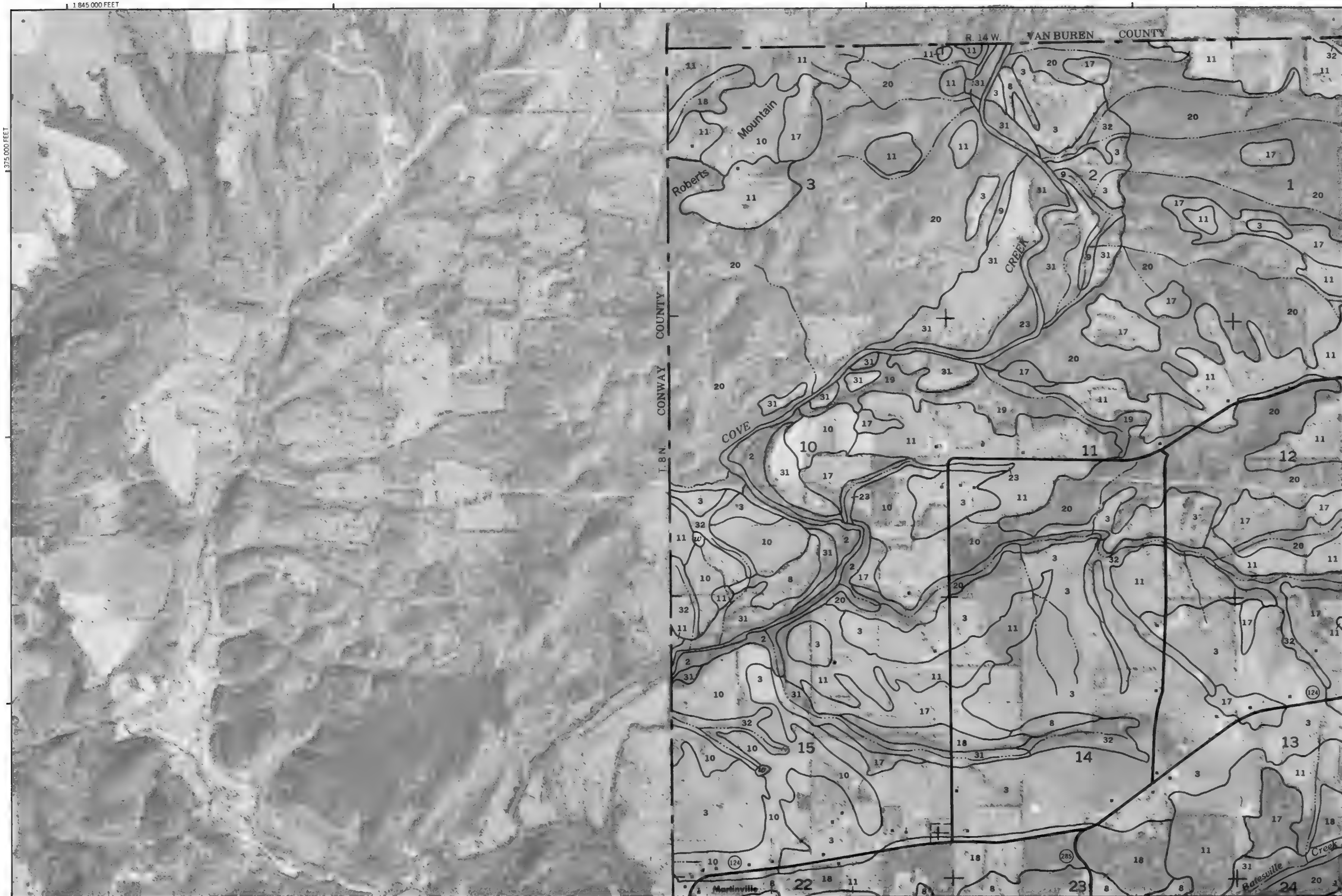
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

SOIL LEGEND

Soil names followed by the superscript 1/ are broadly defined units. The composition of these units is more variable than that of the others in the survey area but has been controlled well enough to be interpreted for the expected use of the soils.

SYMBOL	NAME
1	Acadia silt loam
2	Amy soils, frequently flooded 1/
3	Enders gravelly fine sandy loam, 3 to 8 percent slopes
4	Enders gravelly fine sandy loam, 8 to 12 percent slopes
5	Enders gravelly fine sandy loam, 12 to 45 percent slopes
6	Gallion silt loam
7	Gallion silt loam, occasionally flooded
8	Leadvale silt loam, 1 to 3 percent slopes
9	Leadvale silt loam, 3 to 8 percent slopes
10	Linker fine sandy loam, 1 to 3 percent slopes
11	Linker fine sandy loam, 3 to 8 percent slopes
12	Linker fine sandy loam, 8 to 12 percent slopes
13	Linker-Mountainburg association, rolling 1/
14	Linker-Mountainburg association, hilly 1/
15	McKamie silty clay loam, 3 to 8 percent slopes, severely eroded
16	Moreland silty clay
17	Mountainburg gravelly fine sandy loam, 3 to 8 percent slopes
18	Mountainburg gravelly fine sandy loam, 8 to 12 percent slopes
19	Mountainburg very stony fine sandy loam, 8 to 12 percent slopes
20	Mountainburg very stony fine sandy loam, 12 to 40 percent slopes
21	Muskogee silt loam, 1 to 3 percent slopes
22	Muskogee silty clay loam, 3 to 8 percent slopes, severely eroded
23	Ouachita silt loam, occasionally flooded
24	Perry clay, occasionally flooded
25	Pickwick silt loam, 1 to 3 percent slopes
26	Pickwick silt loam, 3 to 8 percent slopes, eroded
27	Roxana very fine sandy loam
28	Roxana very fine sandy loam, occasionally flooded
29	Sallisaw gravelly sandy loam, 3 to 8 percent slopes
30	Sallisaw gravelly sandy loam, 8 to 12 percent slopes
31	Spadra fine sandy loam, 1 to 3 percent slopes
32	Taft silt loam, 0 to 2 percent slopes
33	Yorktown silty c.ay



1
N

1 Mile
5000 Feet
Scale 1:20000

FAULKNER COUNTY, ARKANSAS NO. 1

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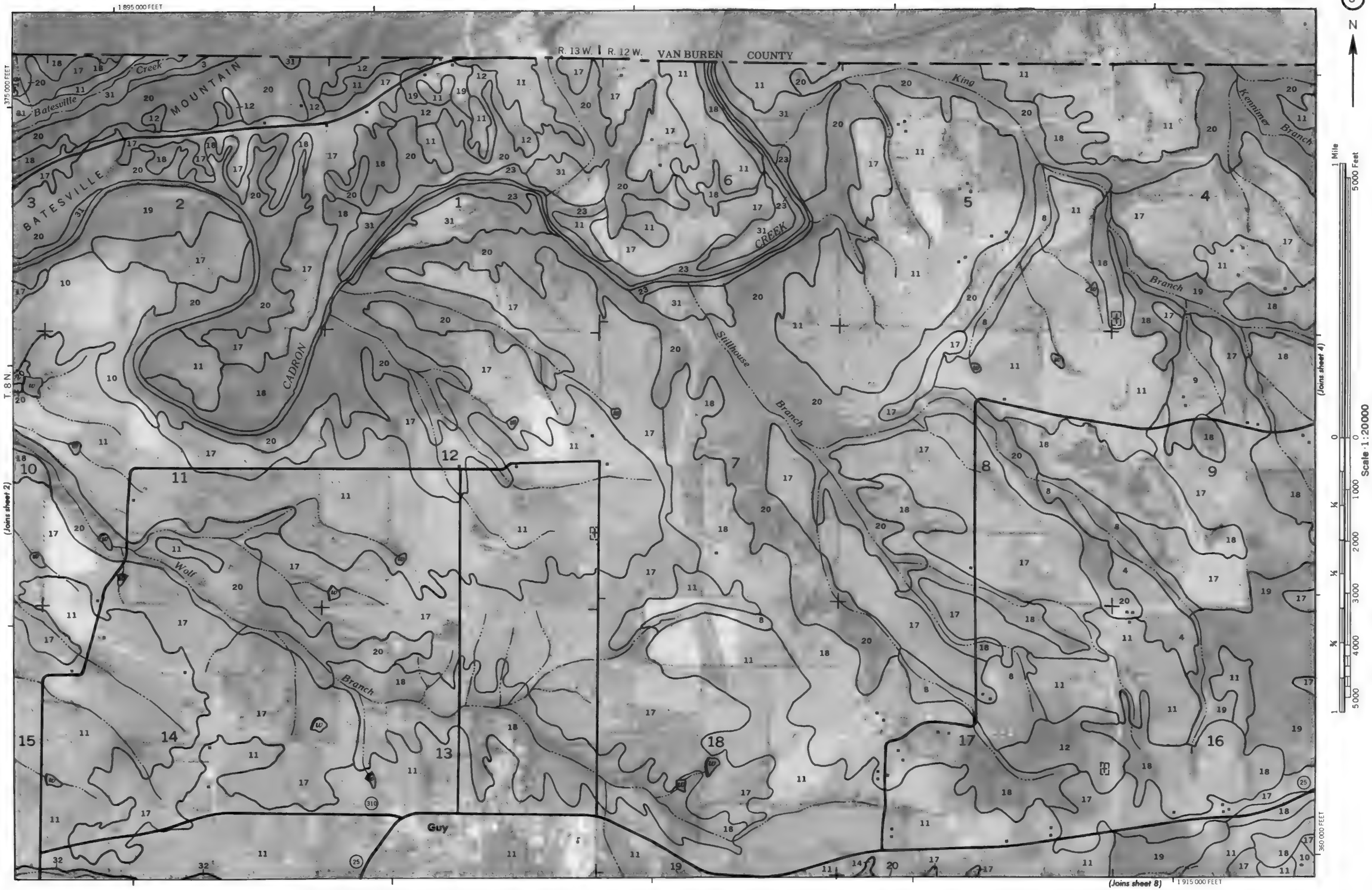

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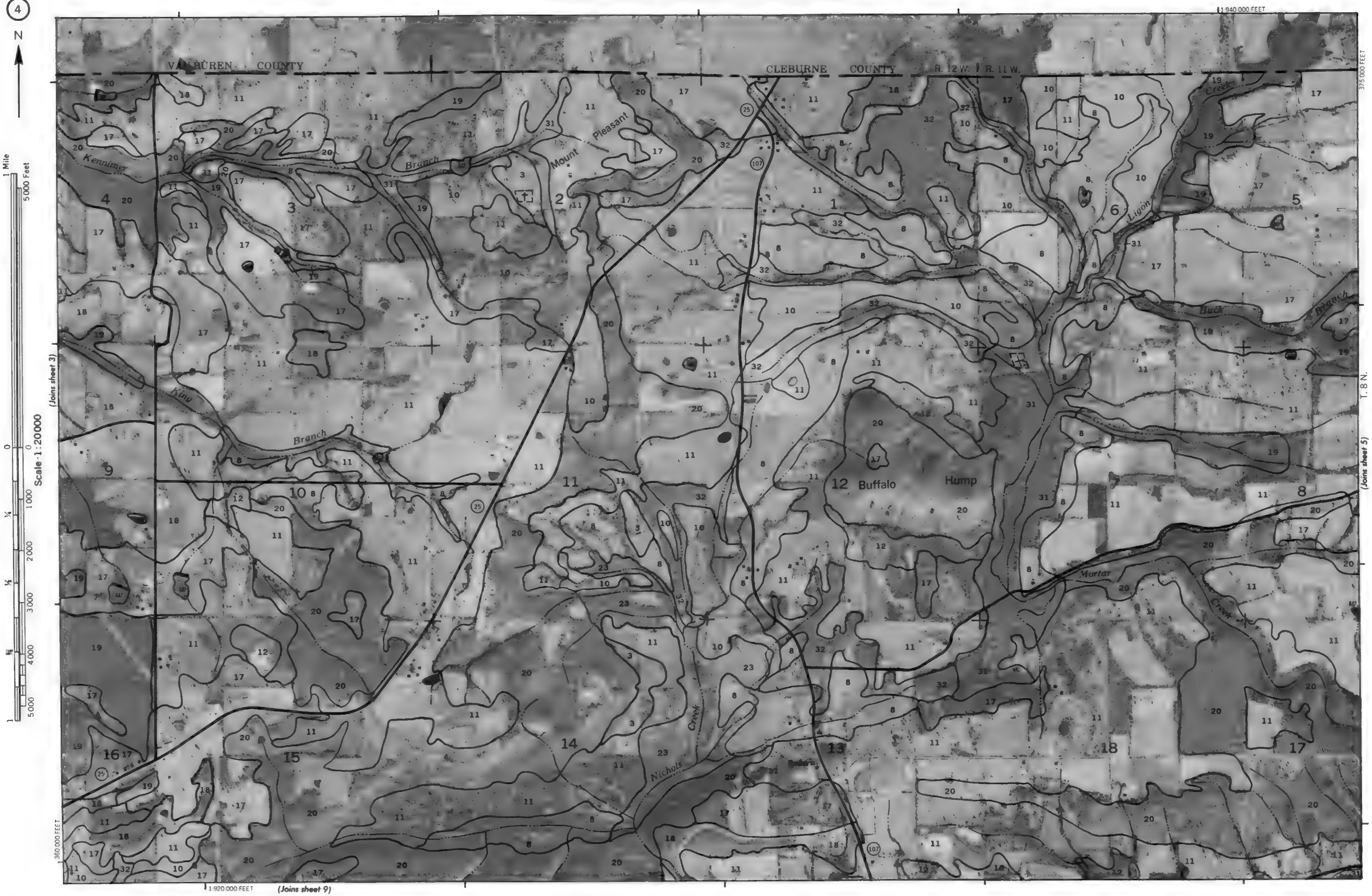

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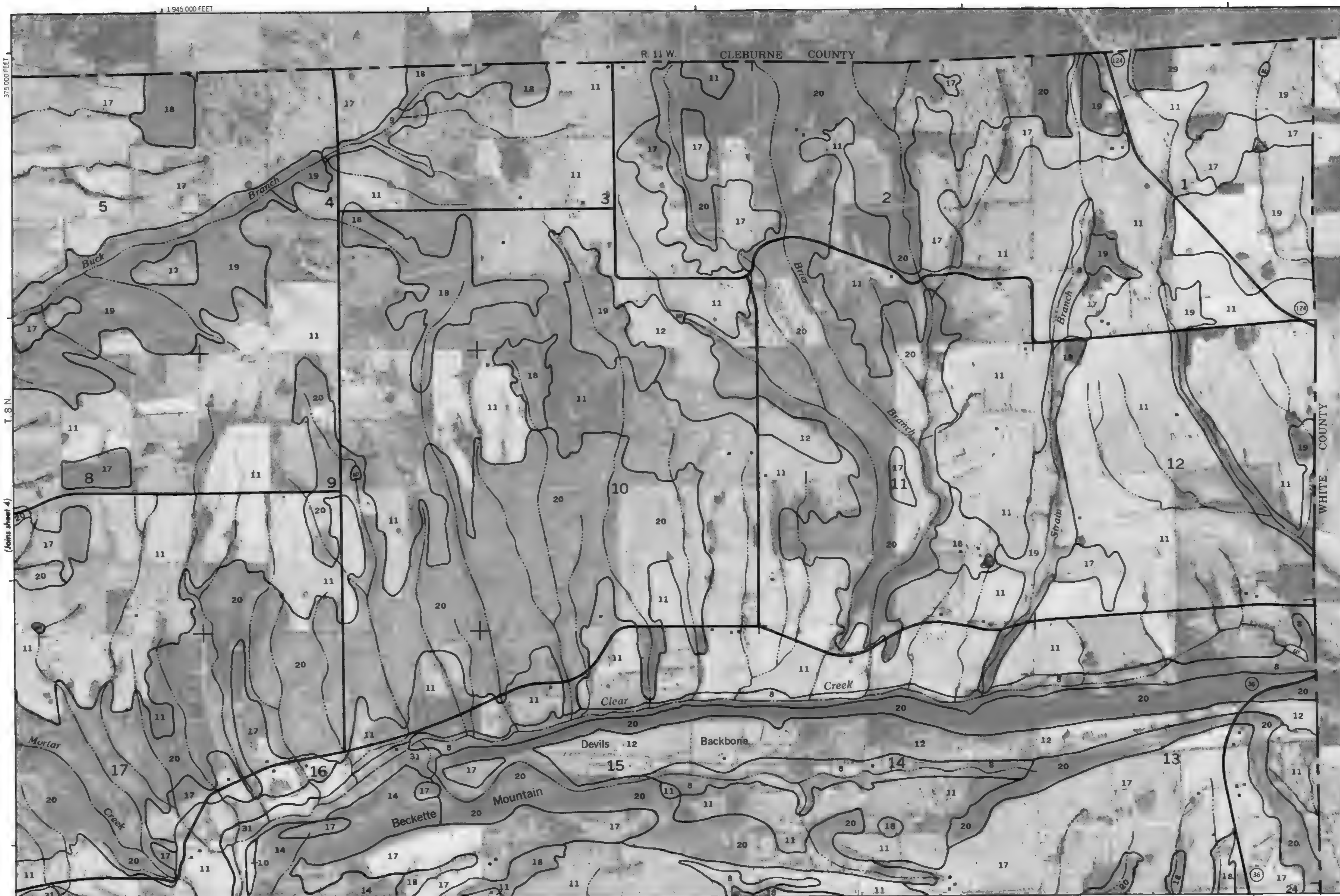
5

N



1 Mile
5000 Feet
Scale 1:20000

FAULKNER COUNTY, ARKANSAS NO. 5

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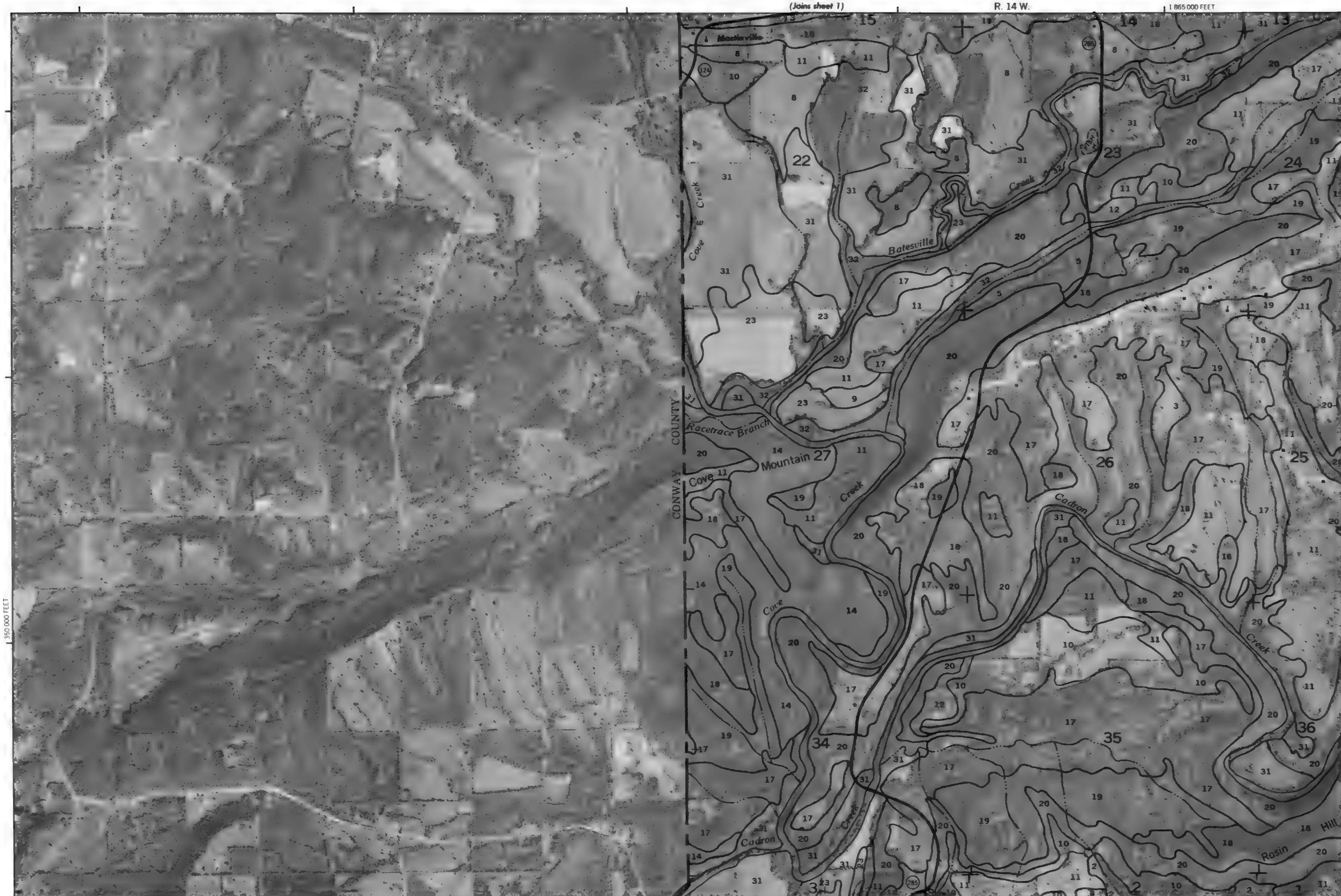
6

N

1 Mile
5000 Feet
0 ¼ ½ ¾ 1
0 1000 2000 3000 4000 5000
Scale 1:20000



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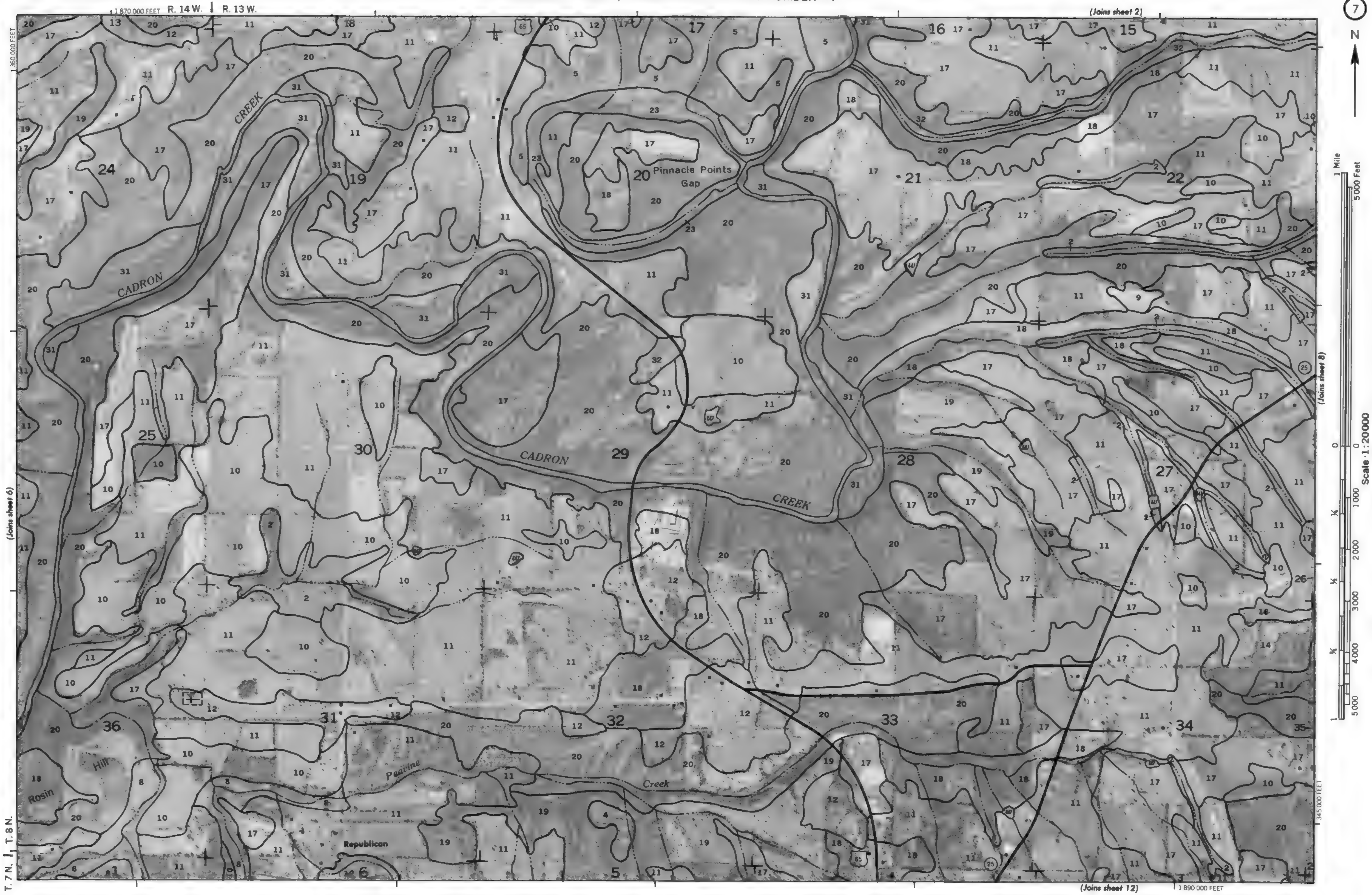

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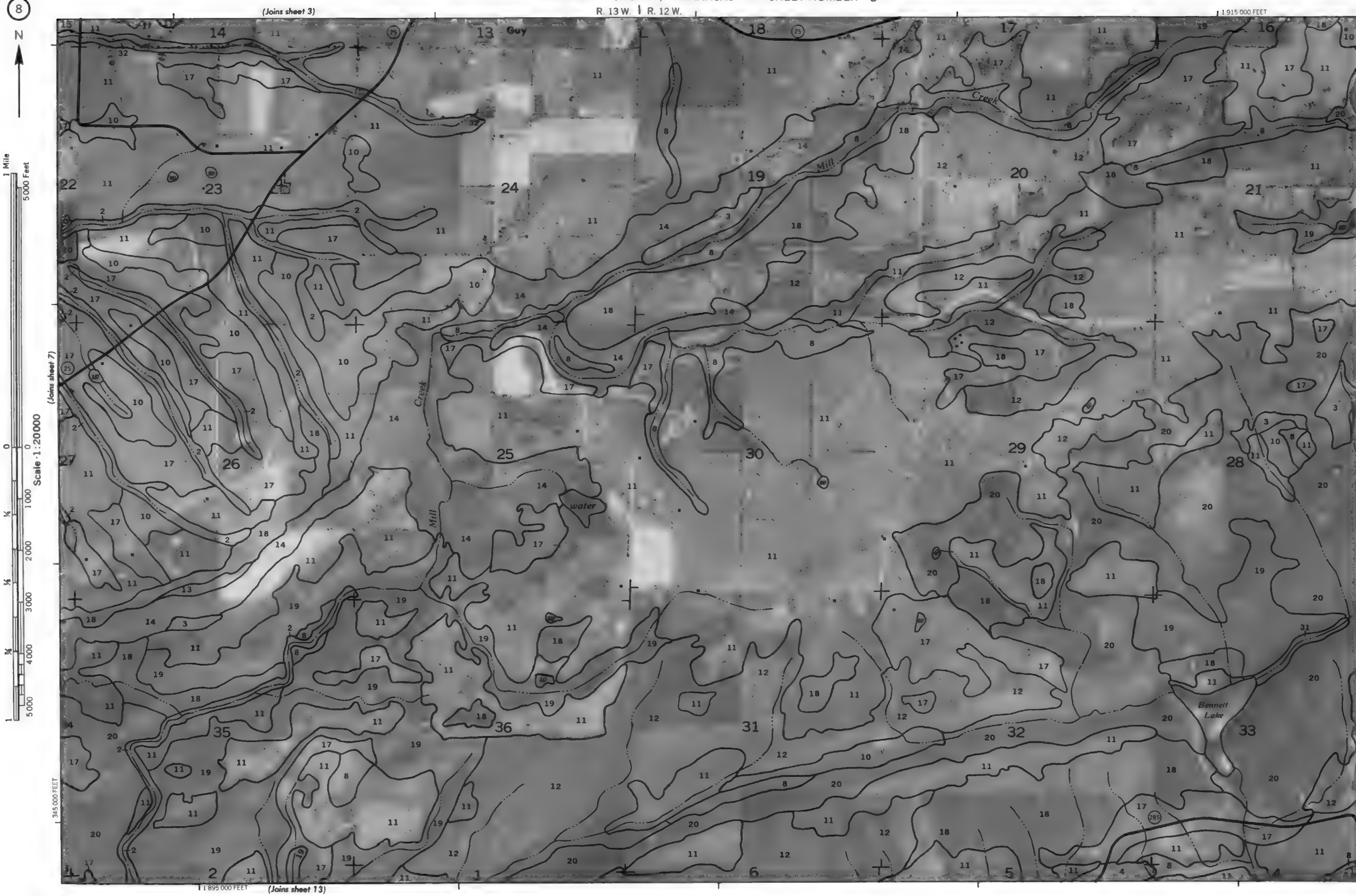

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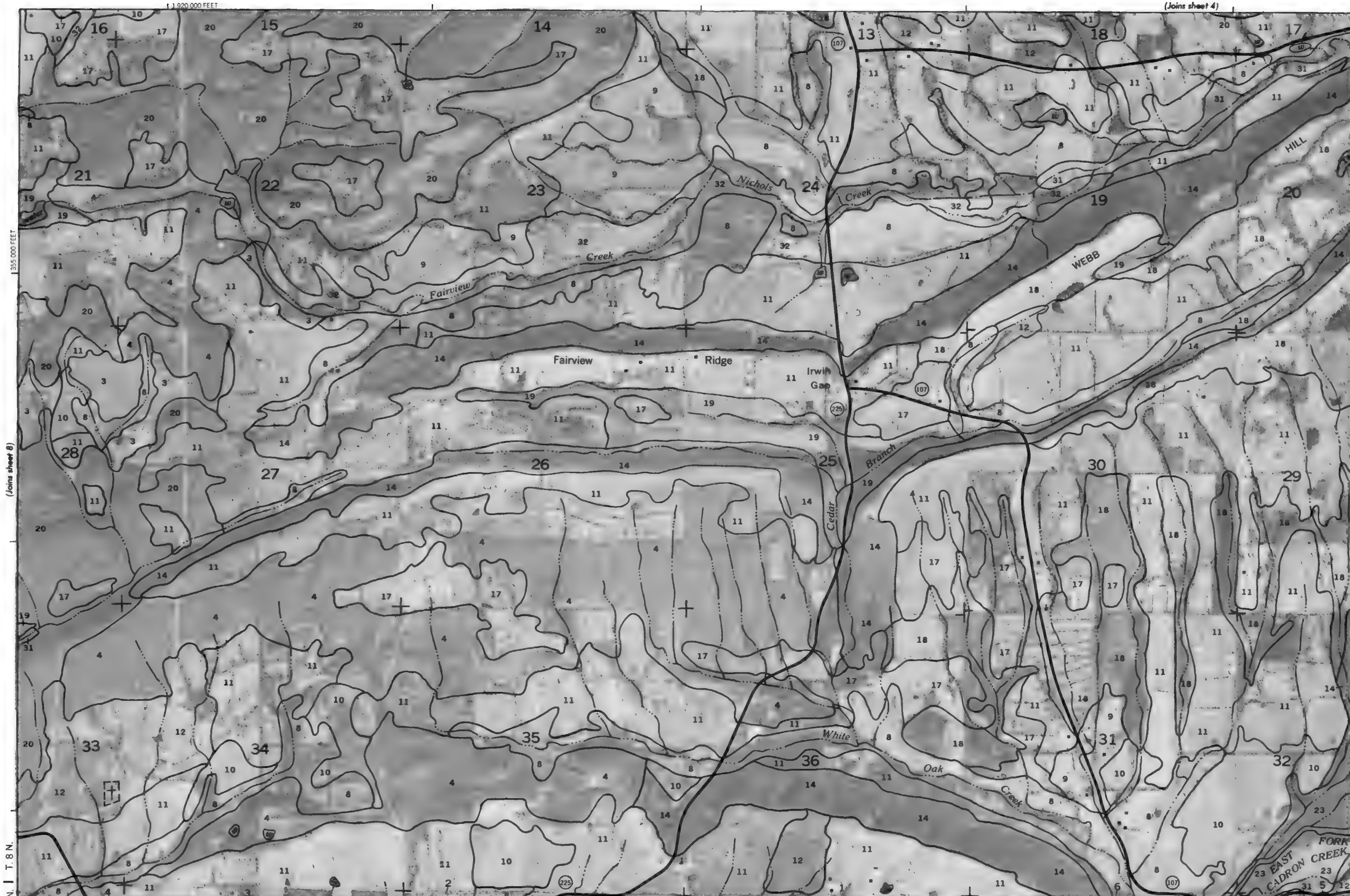
R. 12 W. | R. 11 W.

9

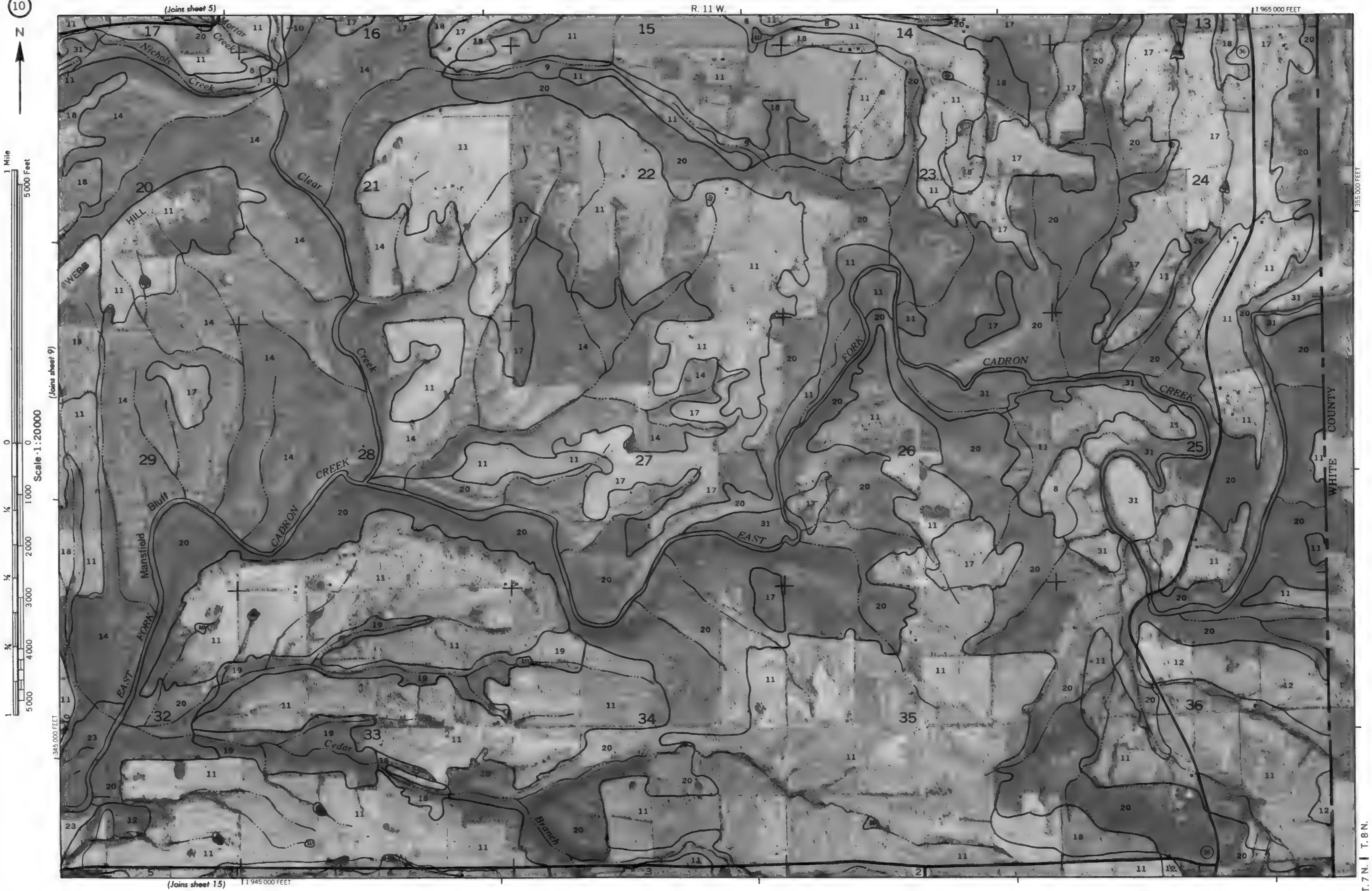


N

1 Mile
5000 Feet
Scale 1:20000

FAULKNER COUNTY, ARKANSAS NO. 9

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 10

11

N

1 Mile

5000 Feet

Scale 1:20000

FAULKNER COUNTY, ARKANSAS NO. 11

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

12

N

R. 14 W. | R. 13 W. (Joins sheet 7)

T. 8 N. | T. 7 N.

(Joins sheet 11)

(Joins sheet 13)

(Joins sheet 17)

1 Mile

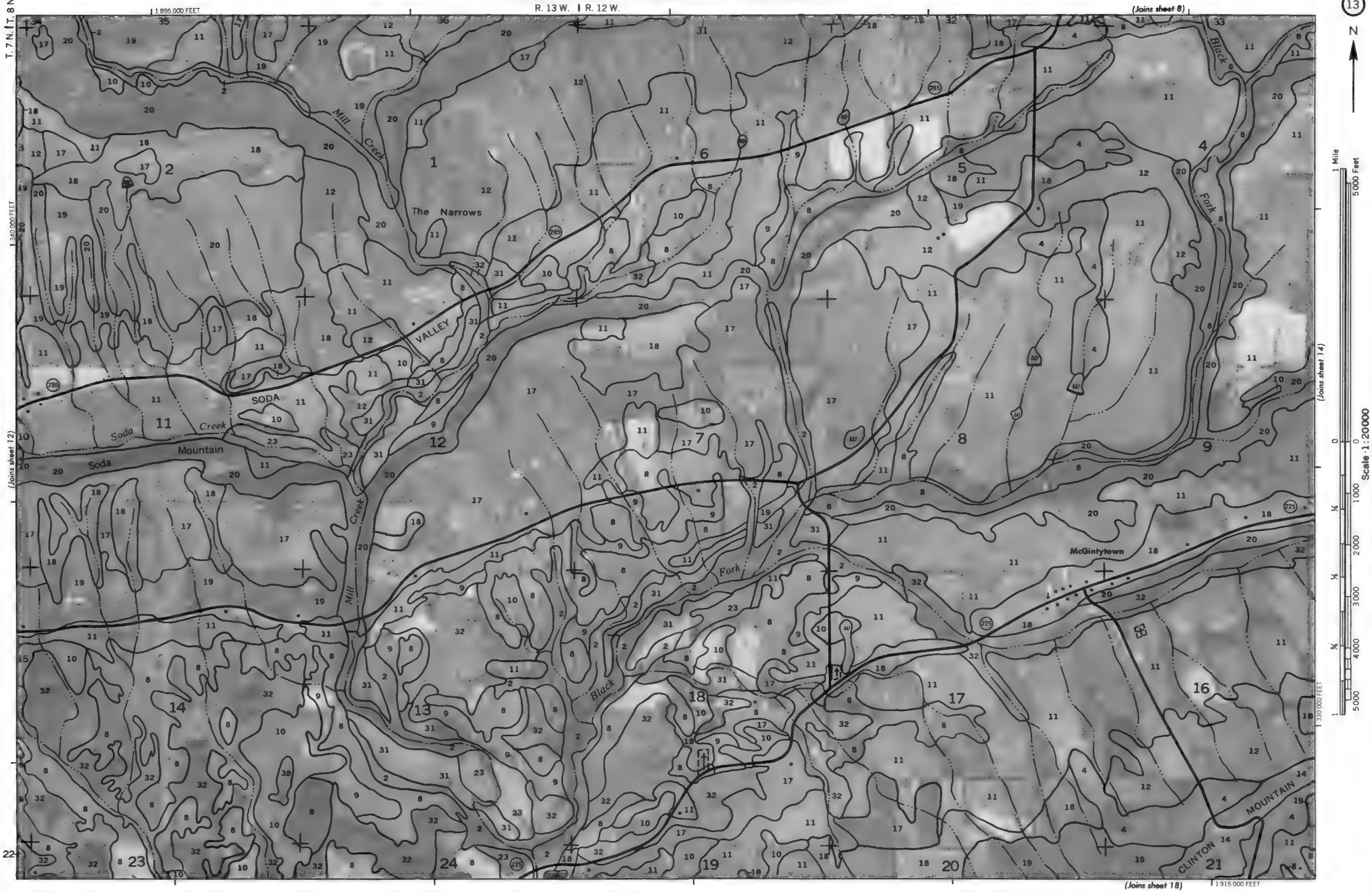
5000 Feet

Scale 1:20000

0 1000 2000 3000 4000 5000

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 12



FAULKNER COUNTY, ARKANSAS NO. 13

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

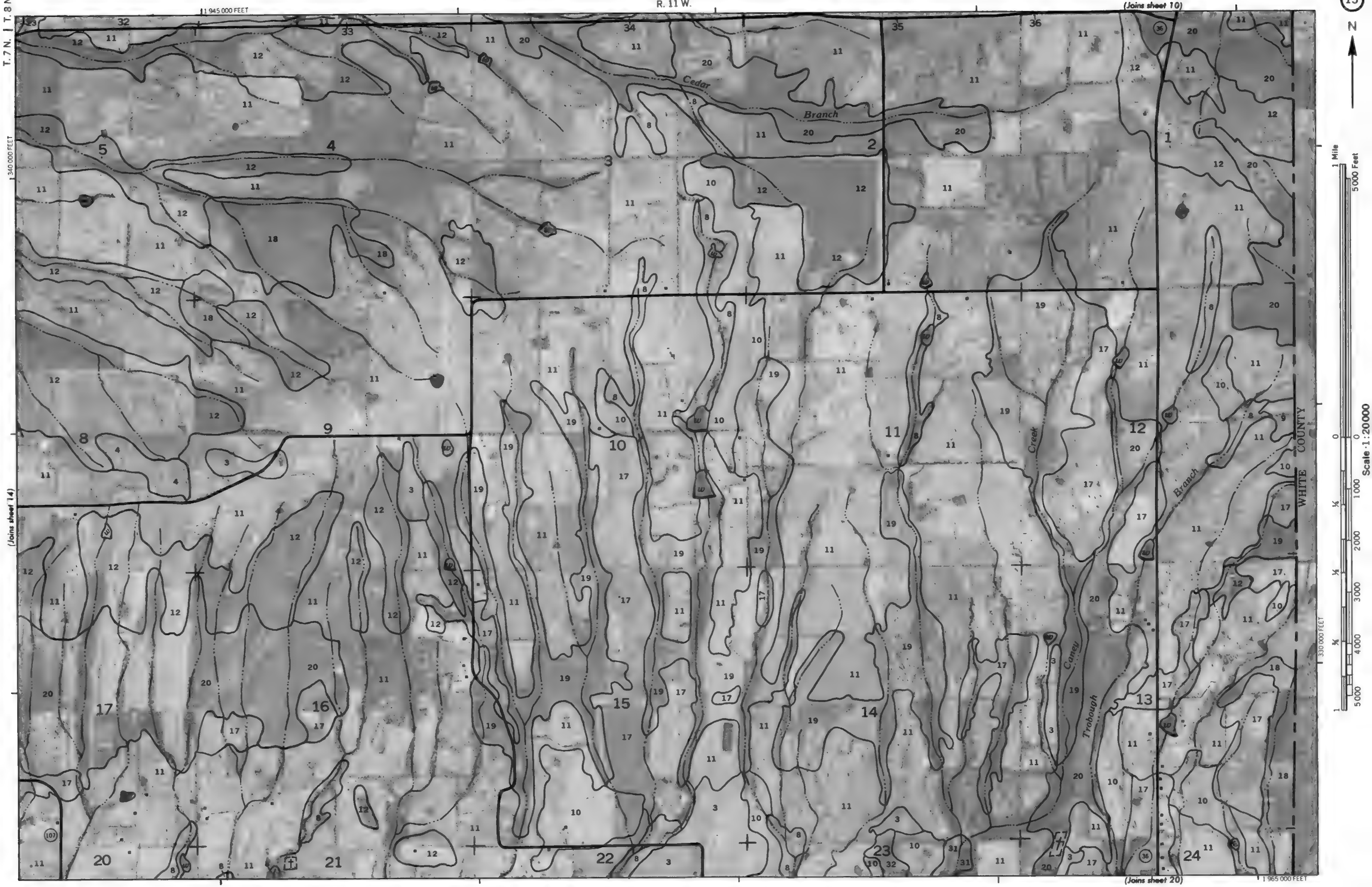
R. 12 W. | R. 11 W.

T. 8 N. | T. 7 N.

N

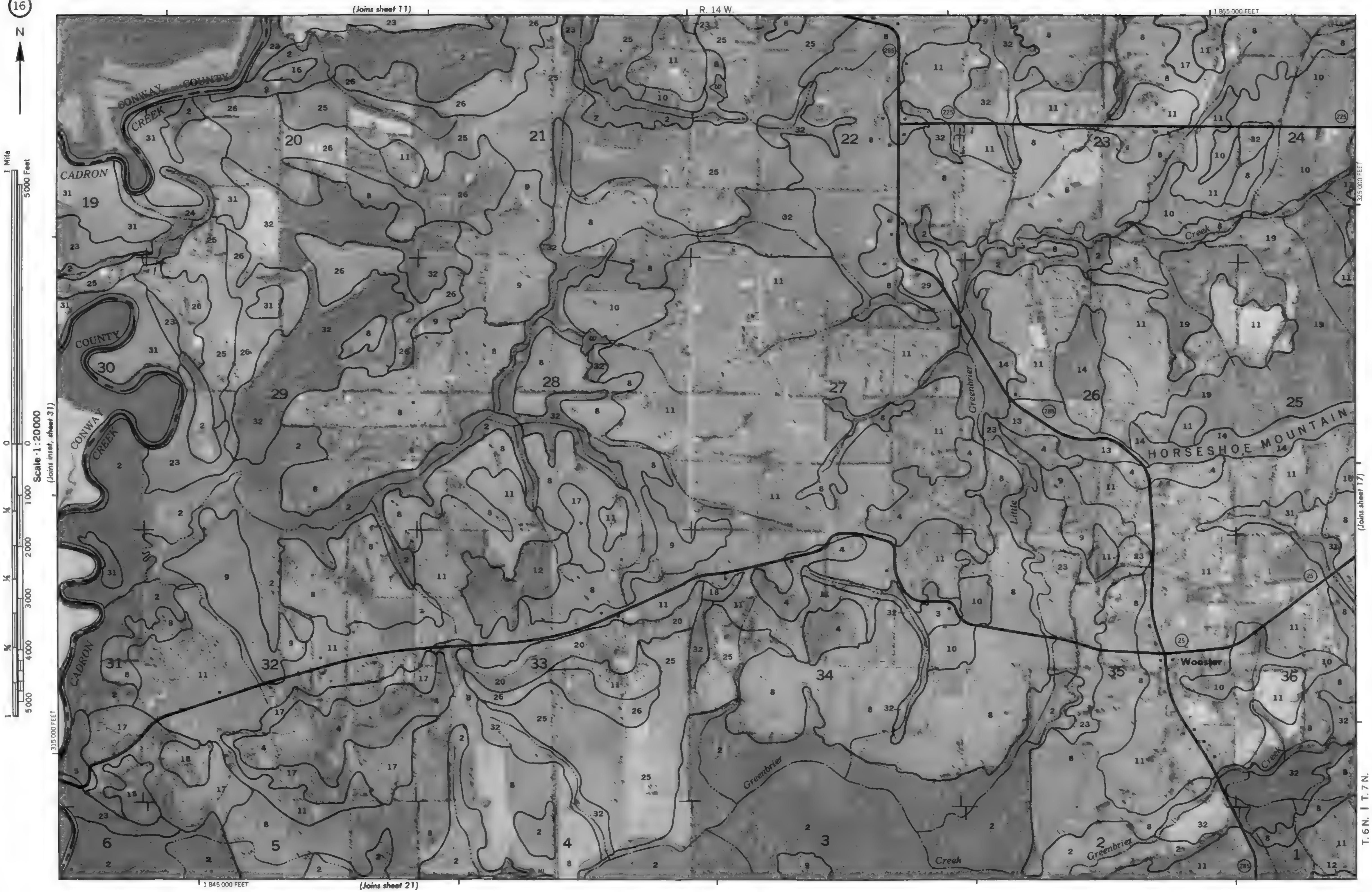
1 Mile
5000 Feet
Scale 1:20000
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



FAULKNER COUNTY, ARKANSAS NO. 15

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

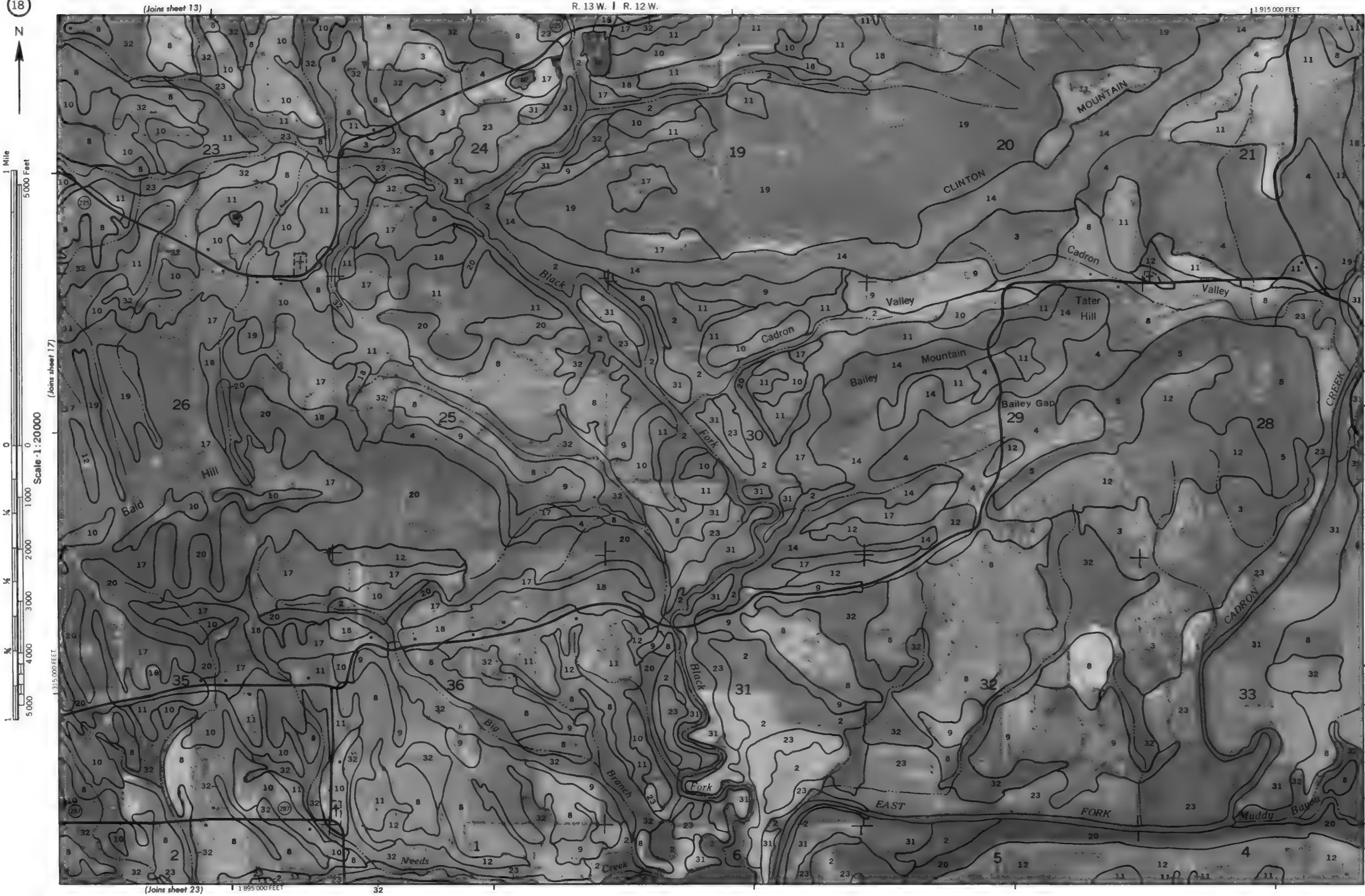


This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

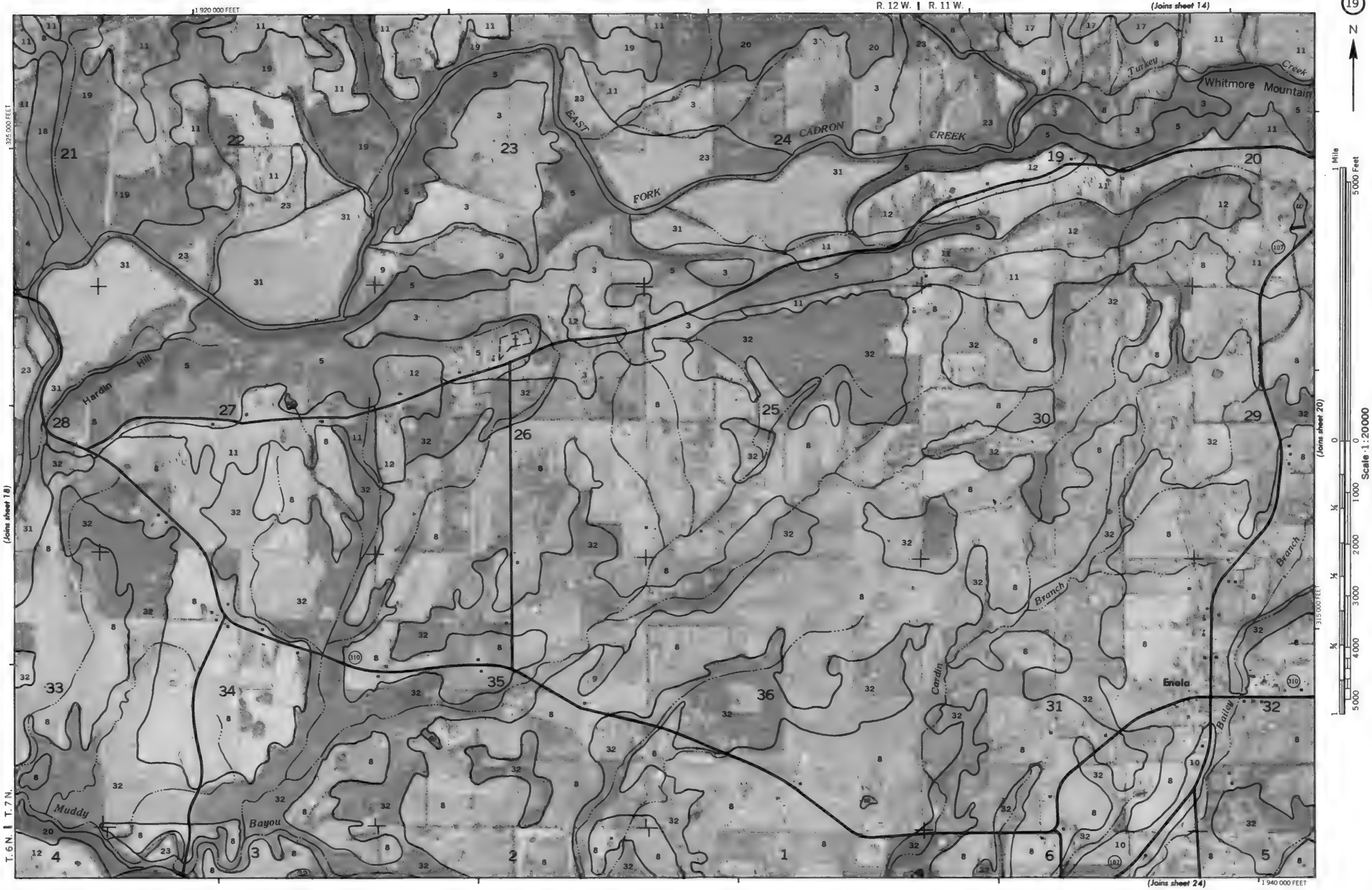
FAULKNER COUNTY, ARKANSAS NO. 16

FAULKNER COUNTY, ARKANSAS NO. 17

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



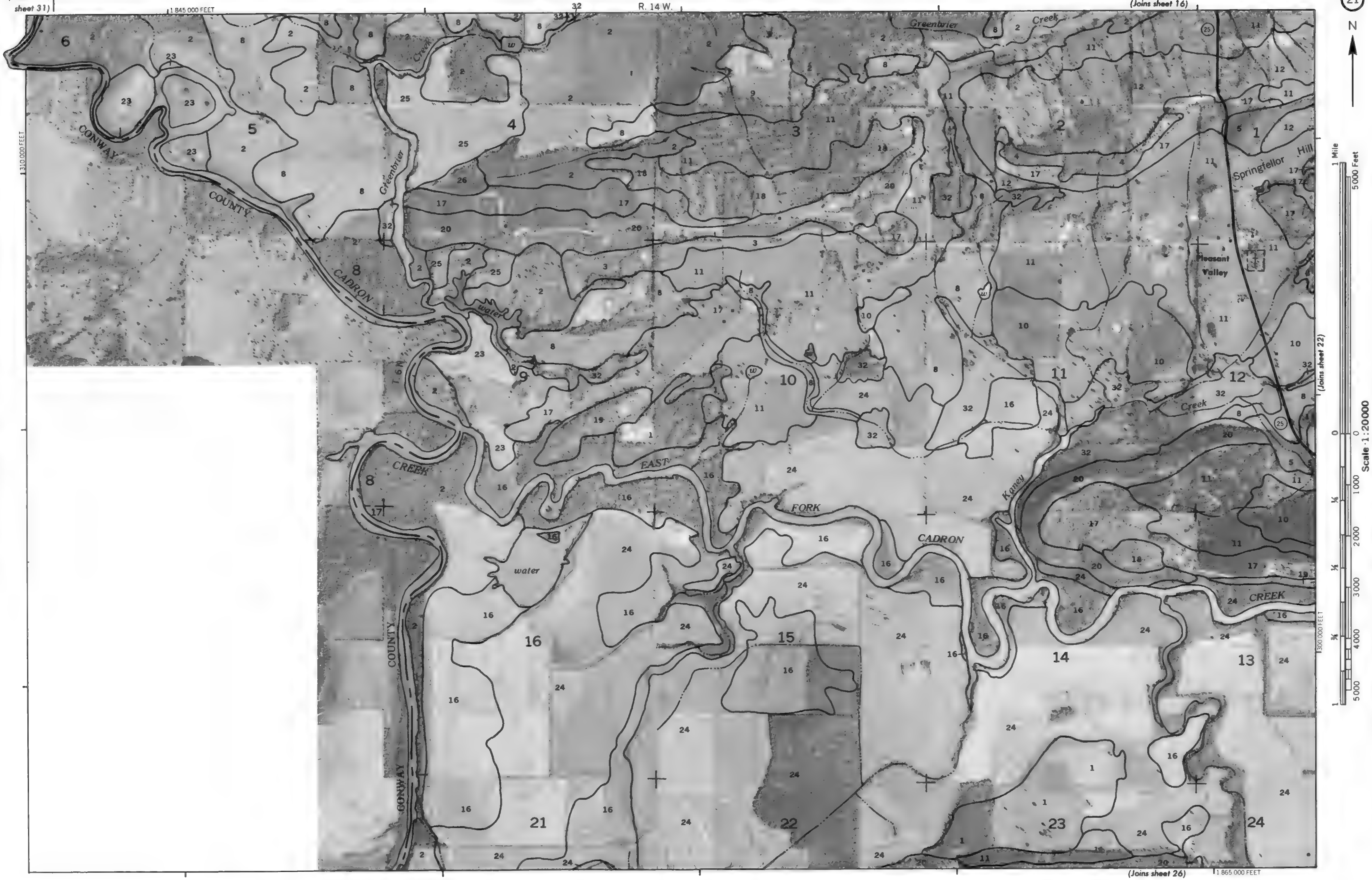
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



FAULKNER COUNTY, ARKANSAS NO. 19

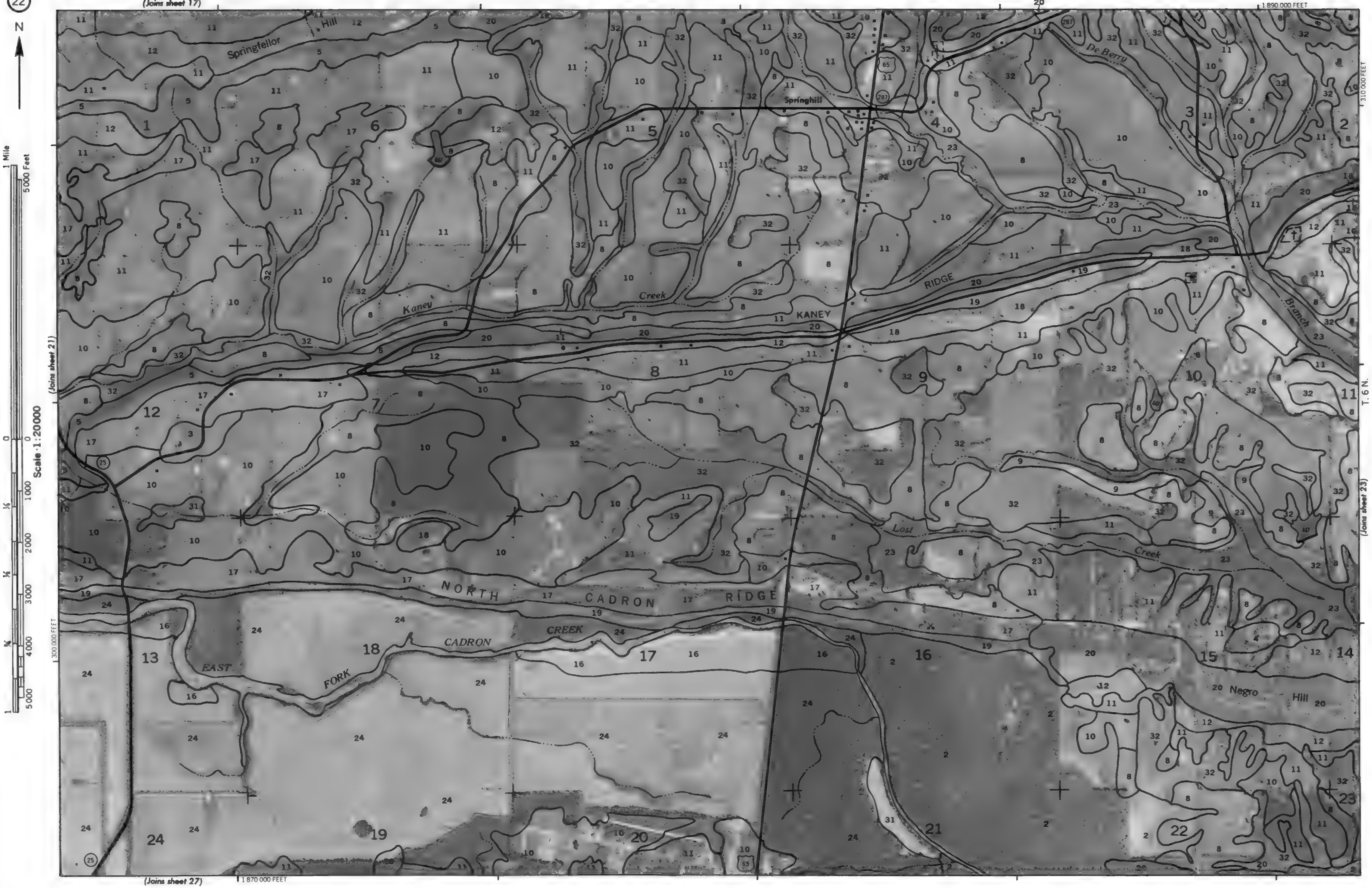
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


20
N
(Joins sheet 15)
R. 11 W.
1 965 000 FEET
325 000 FEET
Dalton
Mountain
Turkey
Creek
Garland
Mountain
Mount
Vernon
Muddy
Bayou
Trobaugh
Branch
Creek
Canal
Branch
Bailey
Caney
Creek
Hall
(Joins sheet 19)
315 000 FEET
WHITE COUNTY
T. 6 N. | T. 7 N.
(Joins sheet 25)
1 945 000 FEET
1 Mile
5000 Feet
Scale 1:20000
FAULKNER COUNTY, ARKANSAS NO. 20



FAULKNER COUNTY, ARKANSAS NO. 21

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 22

R. 13 W. | R. 12 W.

(Joins sheet 18)

23

N

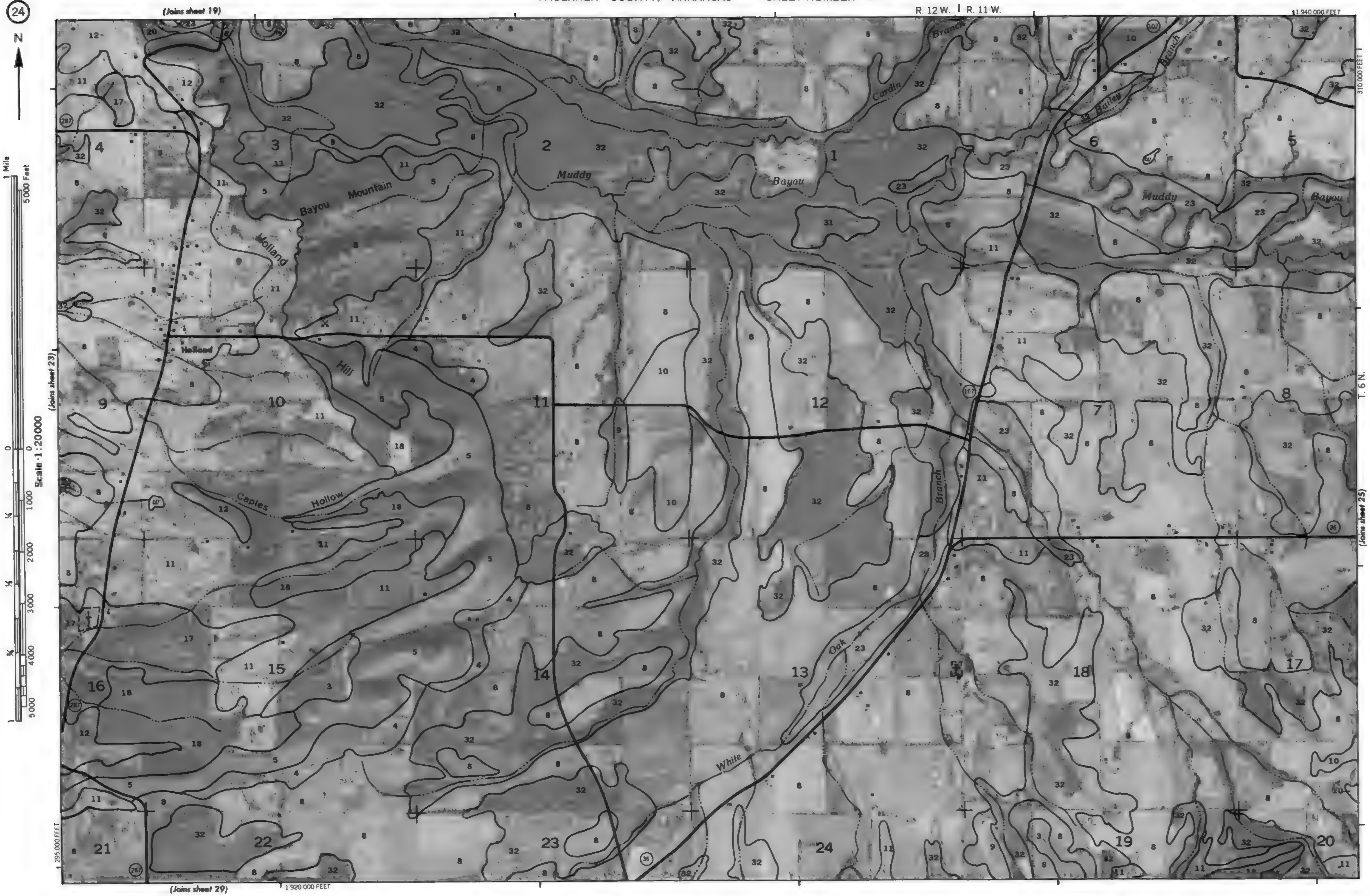
Scale 1:20000

1 Mile

5000 Feet

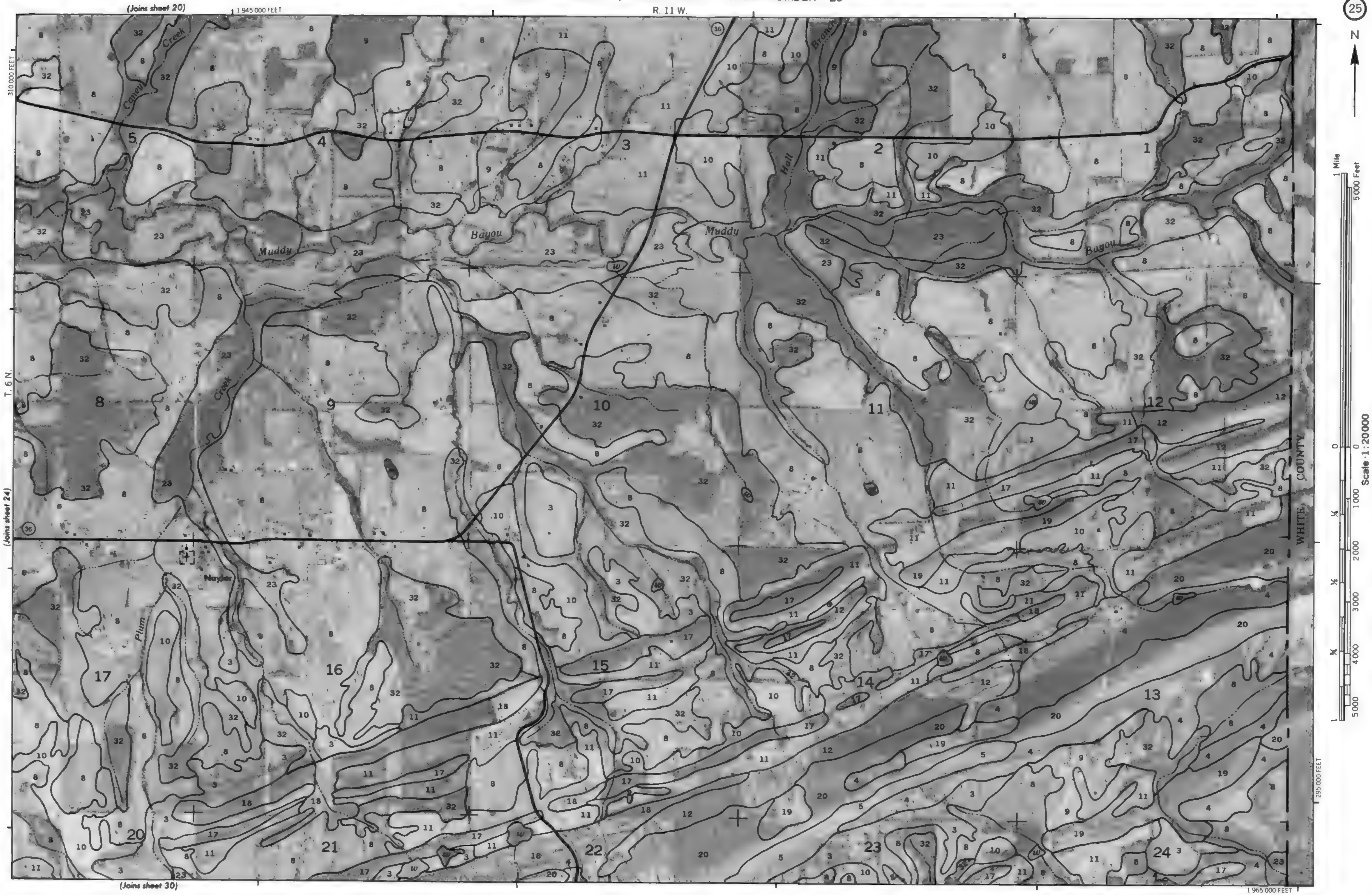
FAULKNER COUNTY, ARKANSAS NO. 23

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 24



FAULKNER COUNTY, ARKANSAS NO. 25

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

26

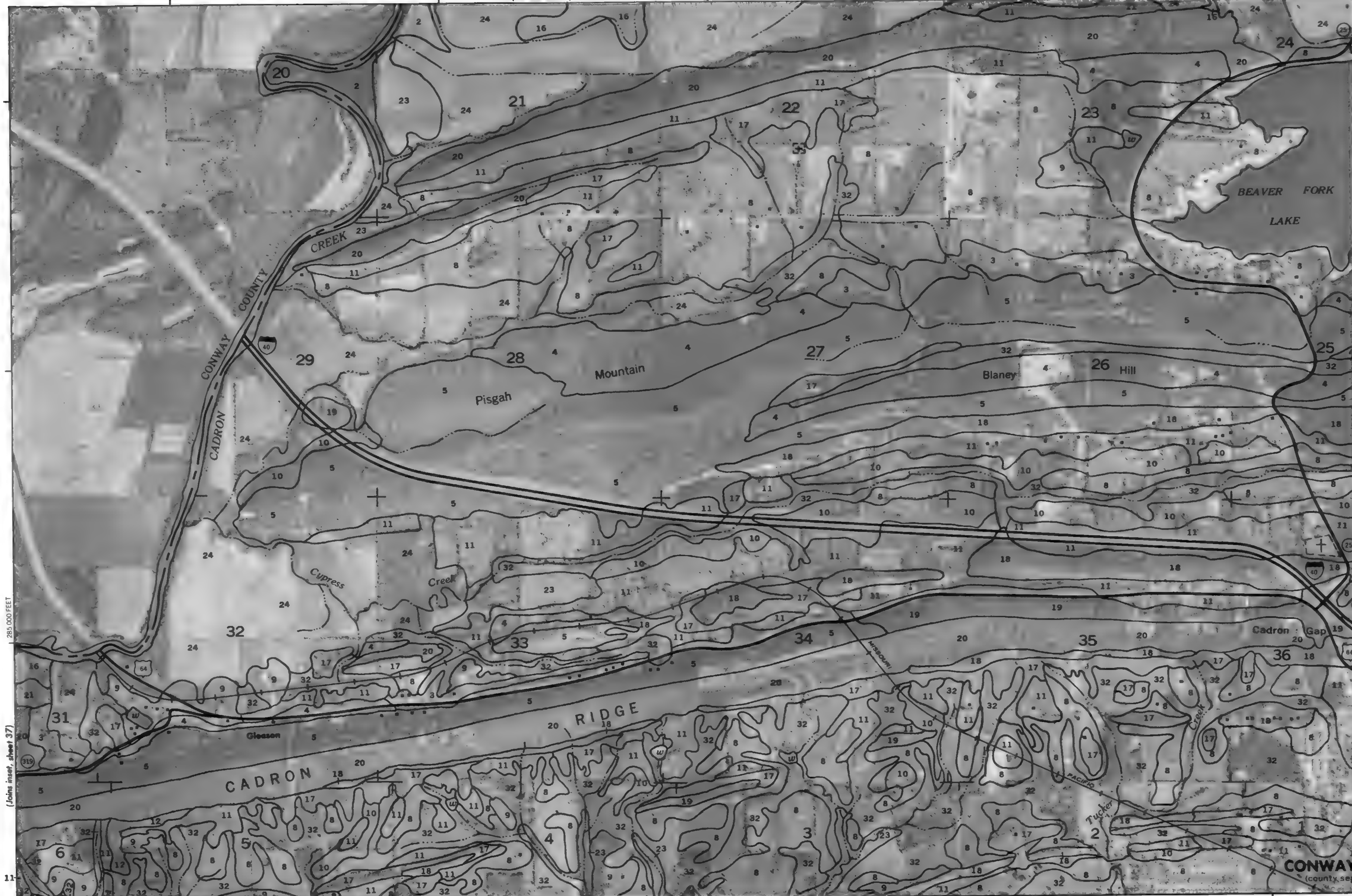
N

(Joins sheet 21)

R. 14 W.

1 865 000 FEET

295 000 FEET



(Joins inset, sheet 37)

(Joins sheet 27)

T. 6 N.

T. 5 N.

285 000 FEET

1 845 000 FEET

(Joins sheet 32)

1 Mile

5000 Feet

Scale 1:20000

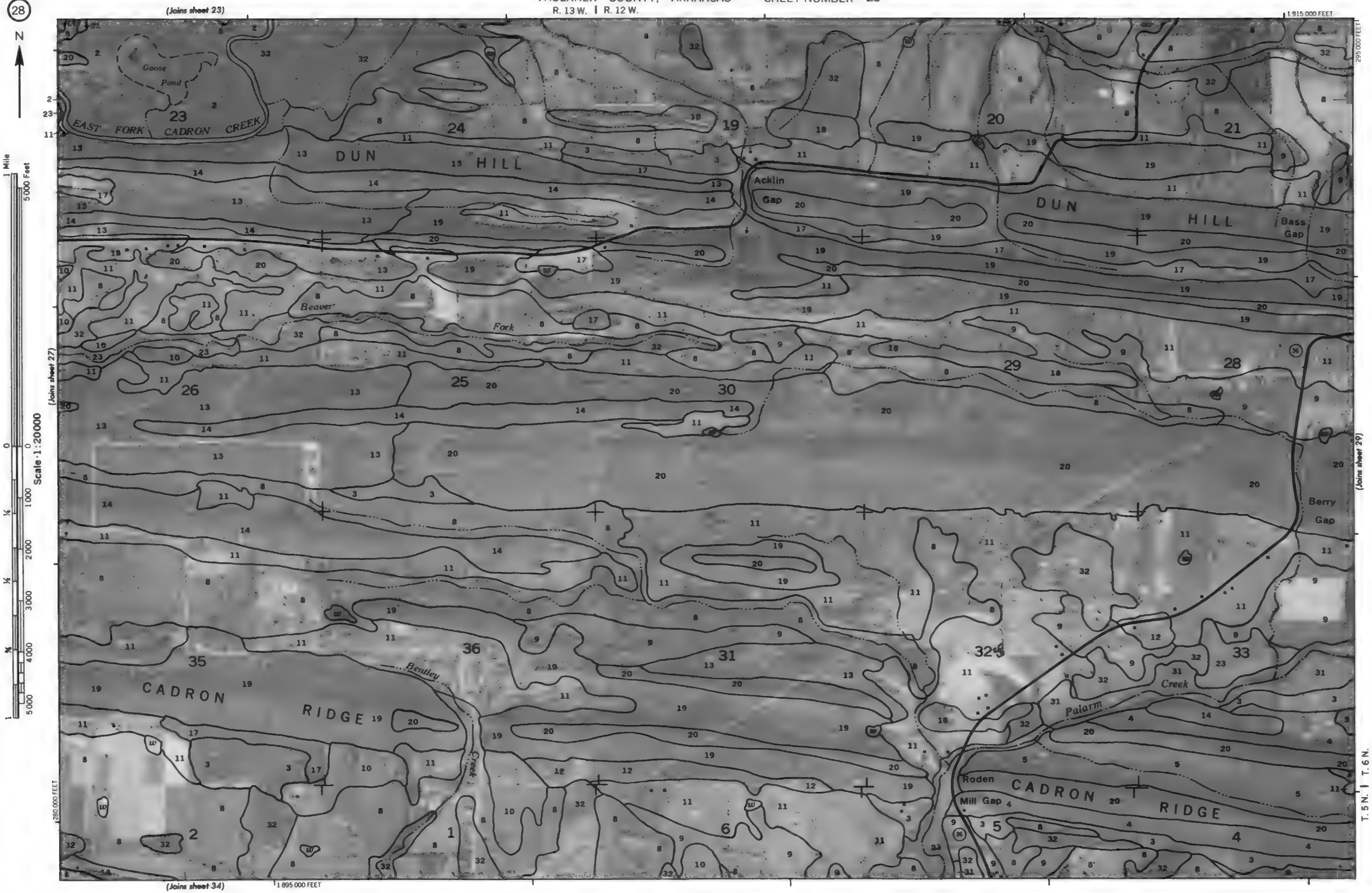
0 1000 2000 3000 4000 5000

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 26

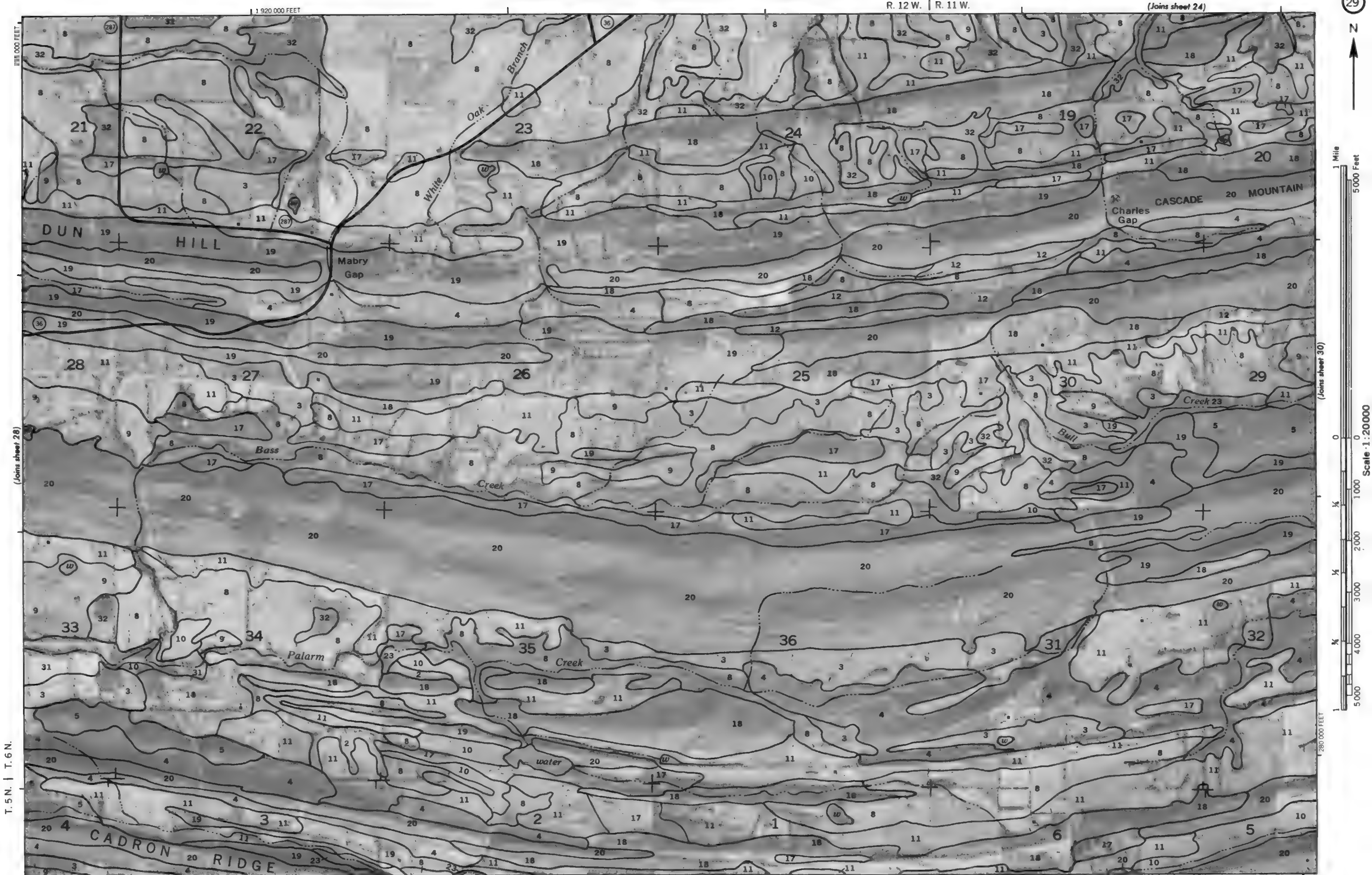
(27)

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



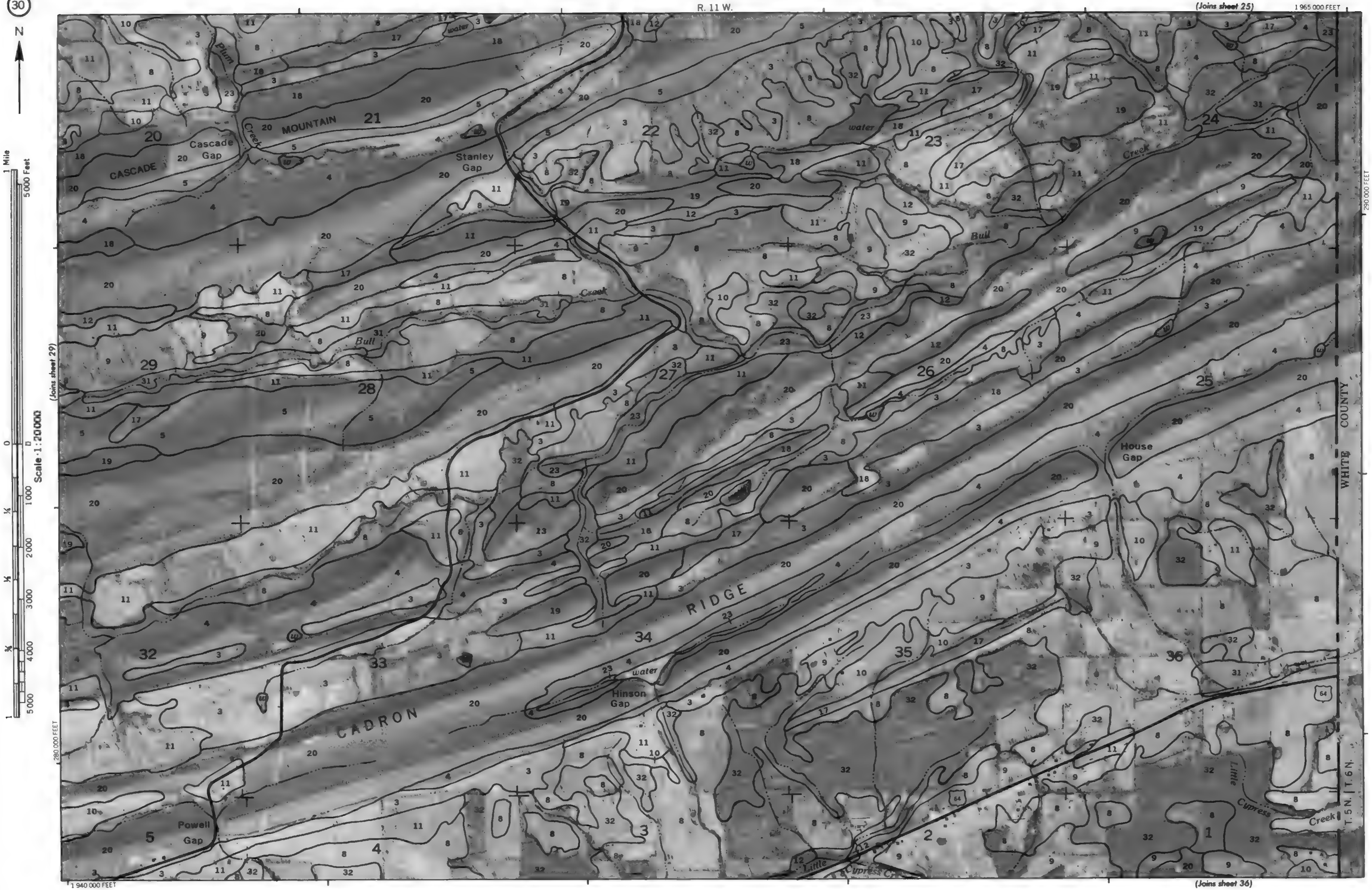
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 28

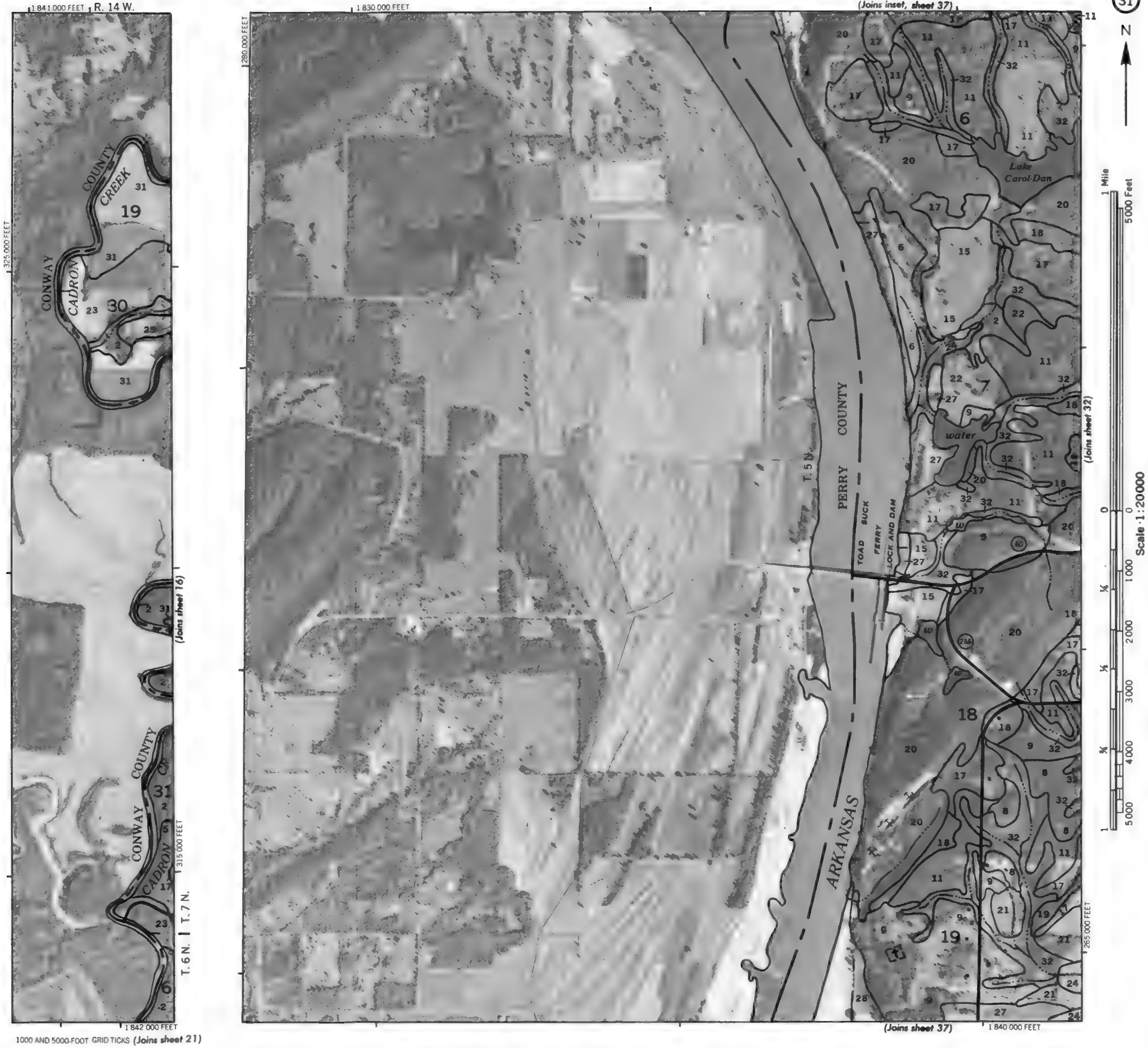


This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

30

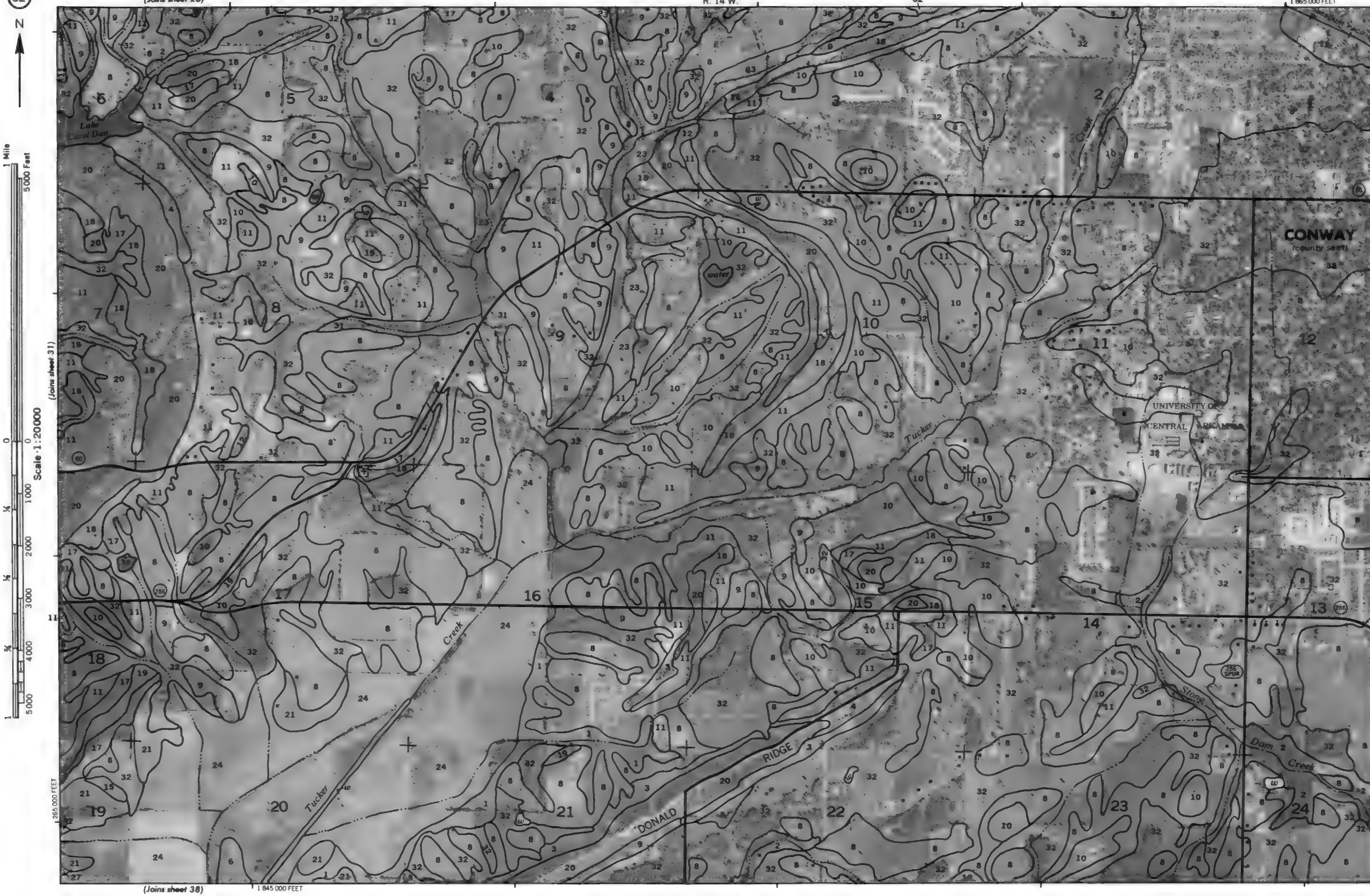


This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



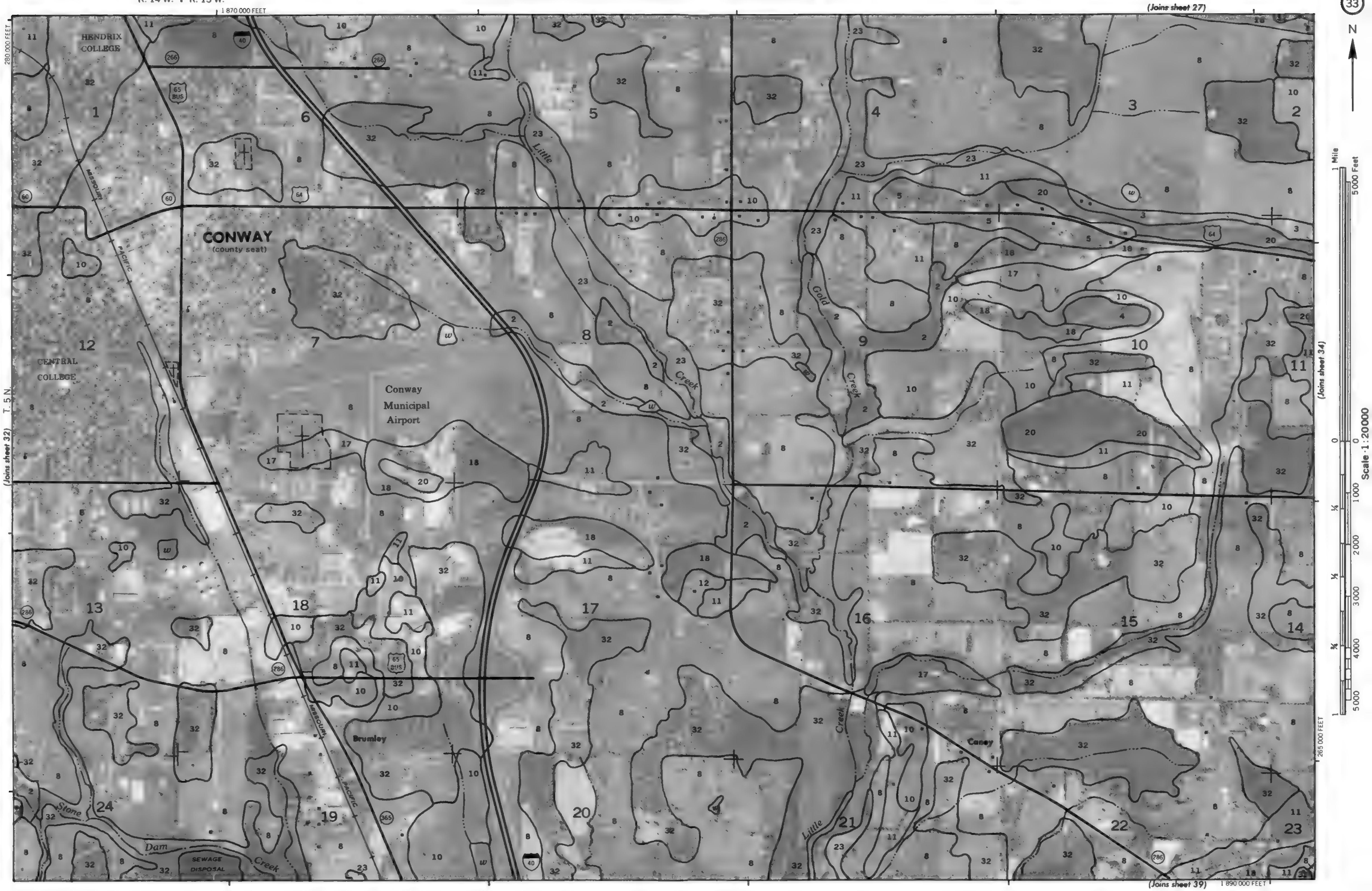
FAULKNER COUNTY, ARKANSAS NO. 31

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



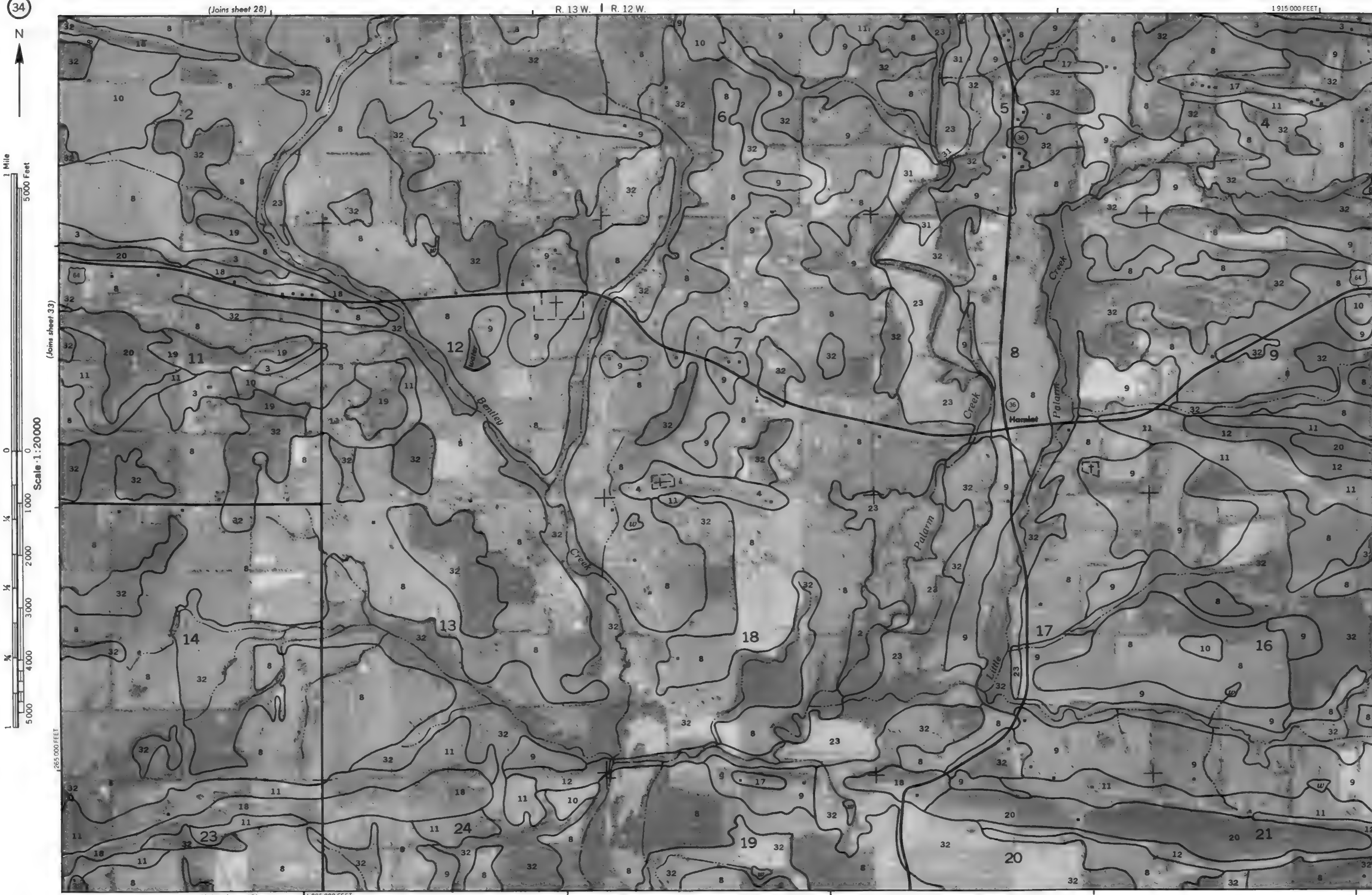
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 32

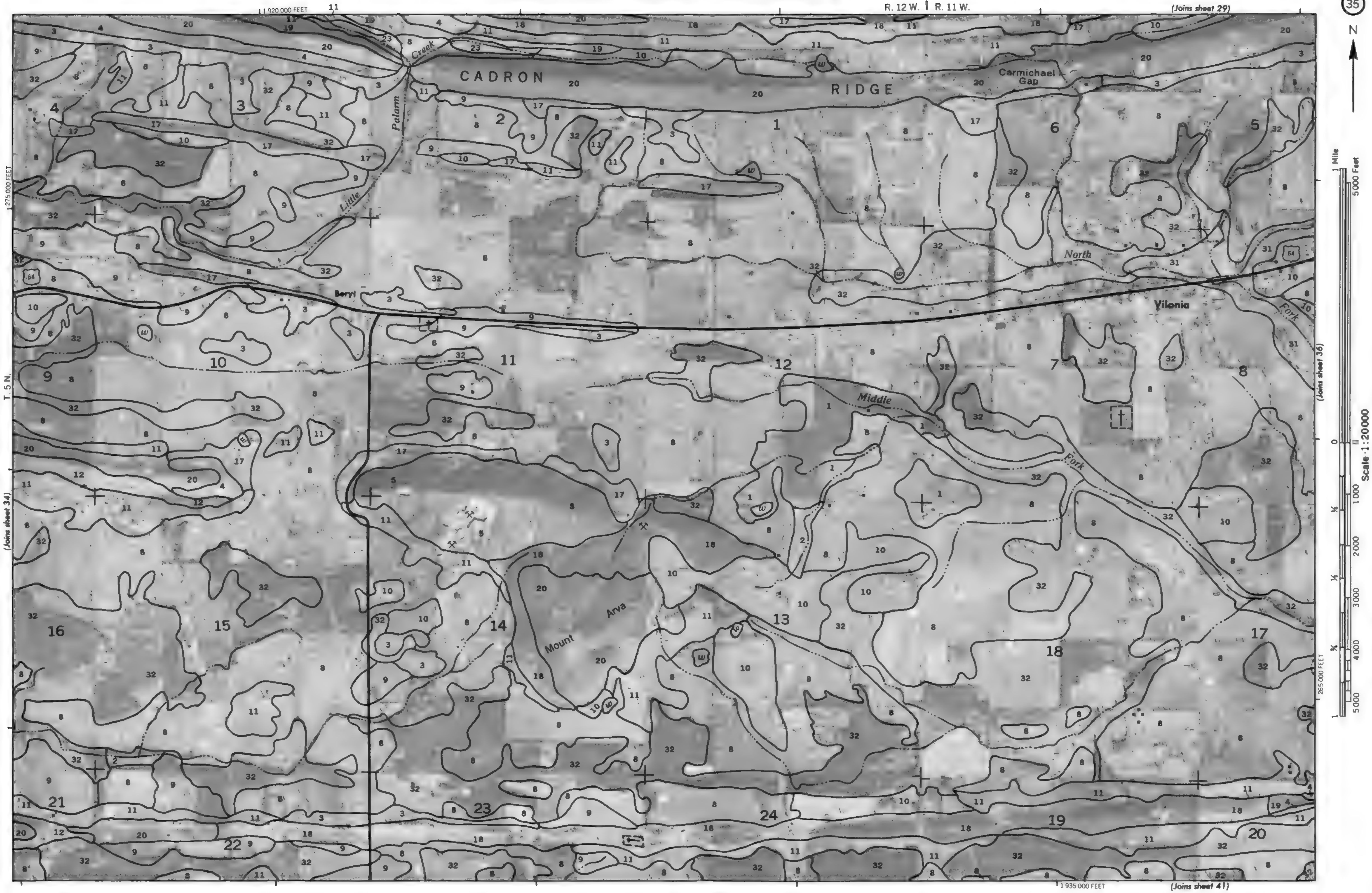


FAULKNER COUNTY, ARKANSAS NO. 33

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

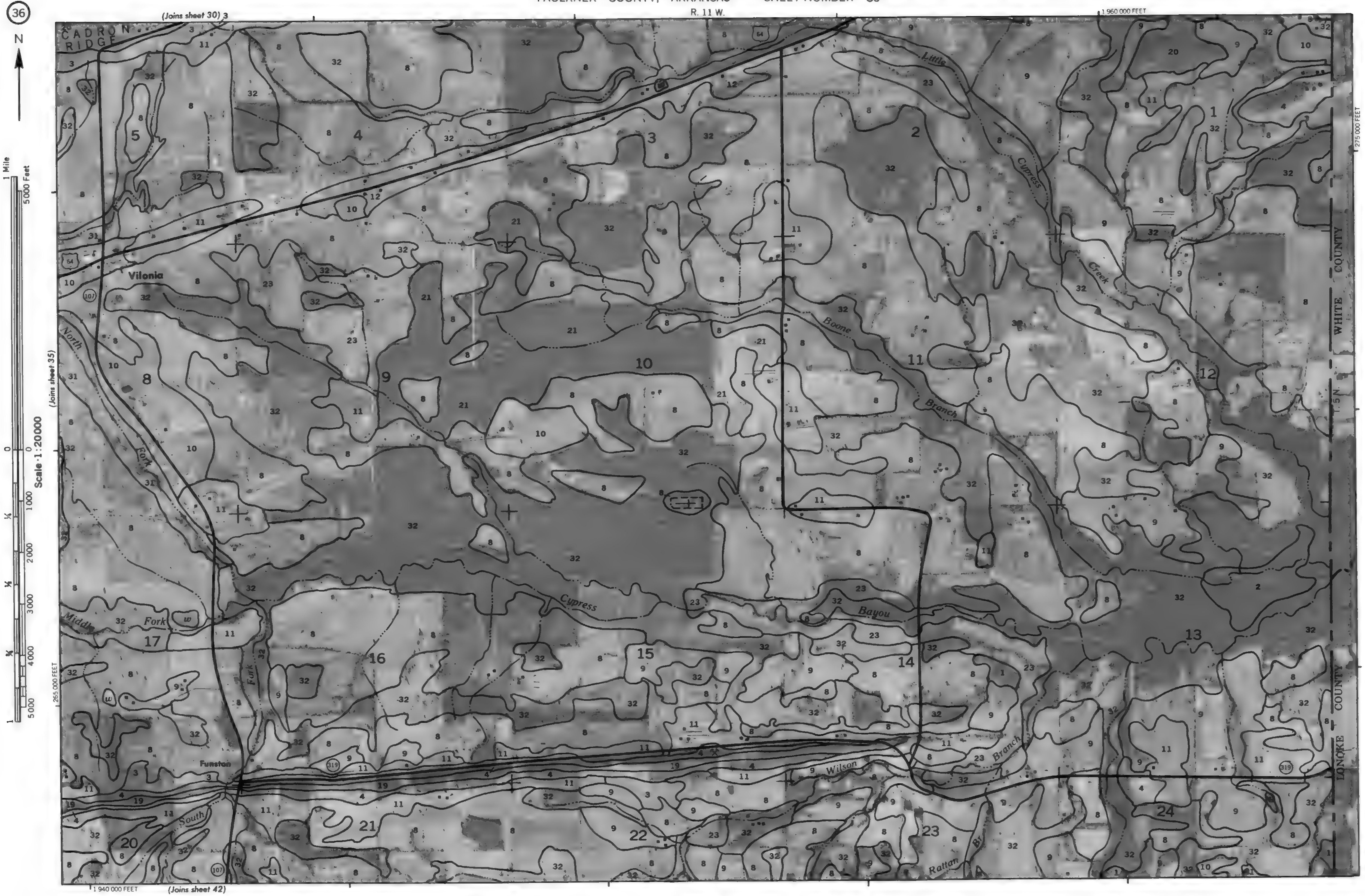


FAULKNER COUNTY, ARKANSAS NO. 34



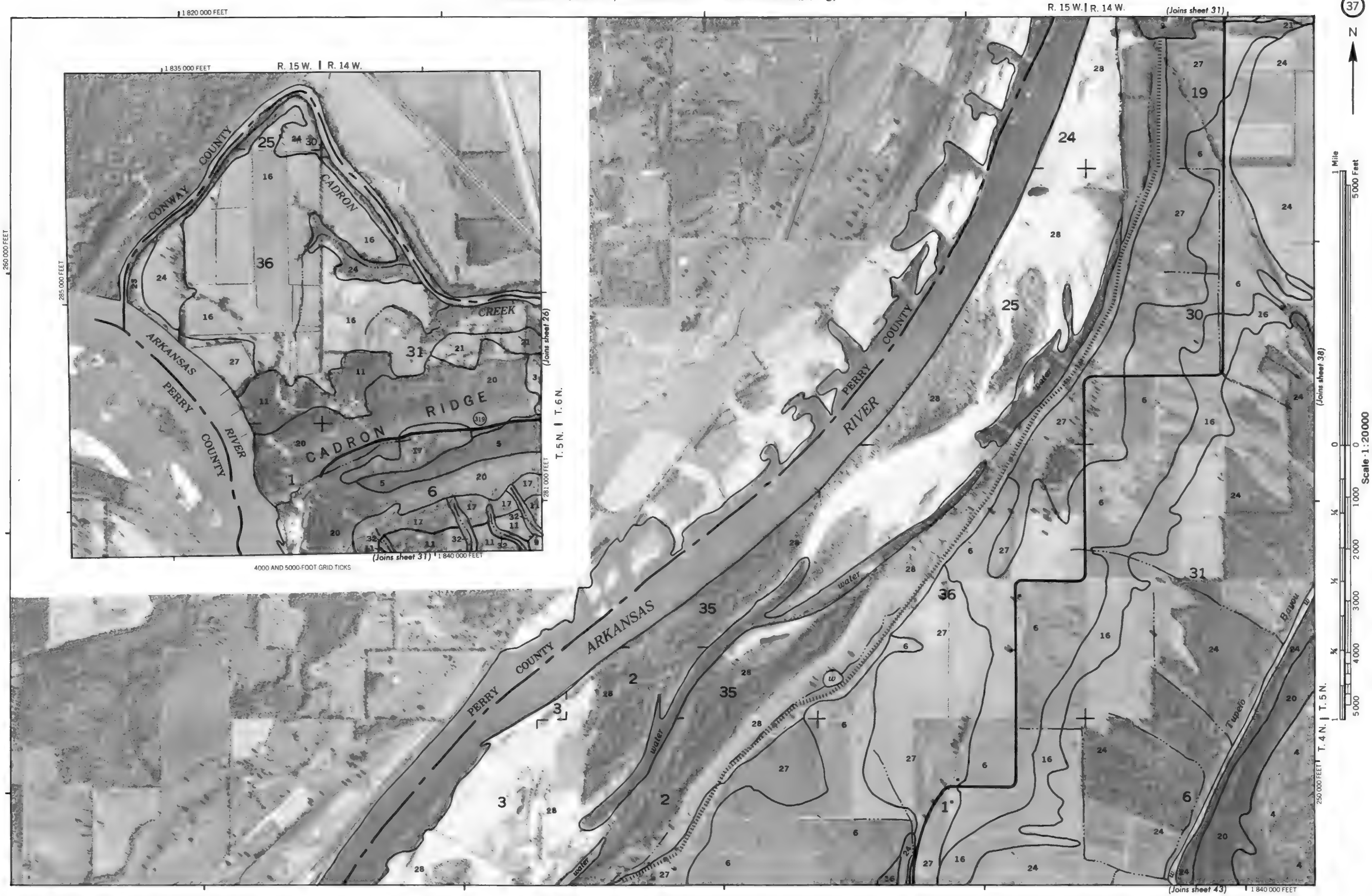
FAULKNER COUNTY, ARKANSAS NO. 35

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

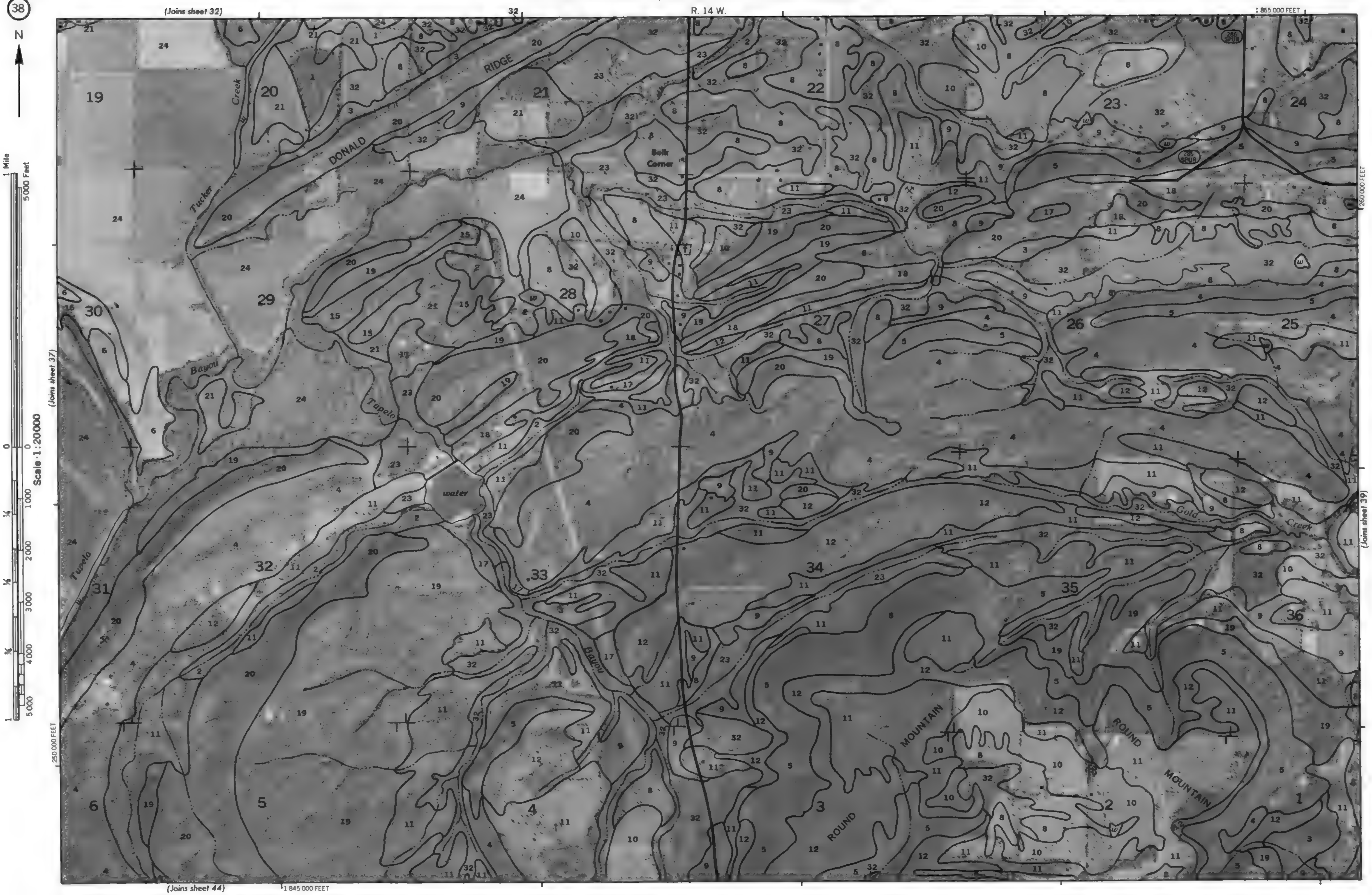


This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 36



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 38

39

R. 14 W. | R. 13 W. 1 870 000 FEET

(Joins sheet 33)

260 000 FEET

(Joins sheet 38)

(Joins sheet 40)

250 000 FEET

T. 4 N. | T. 5 N.

(Joins sheet 45) 1 890 000 FEET

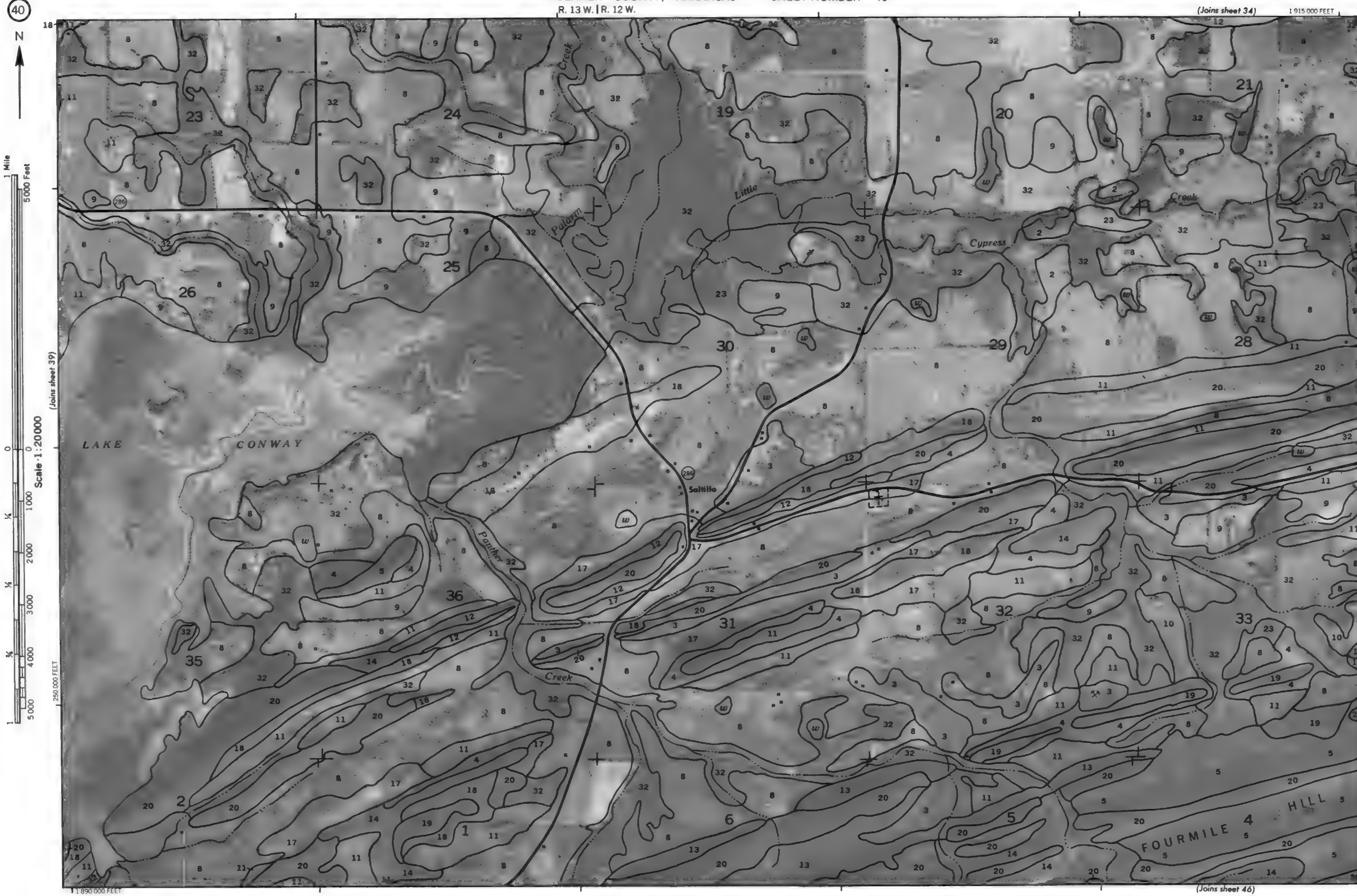
N

1 Mile 5000 Feet

Scale 1:20000

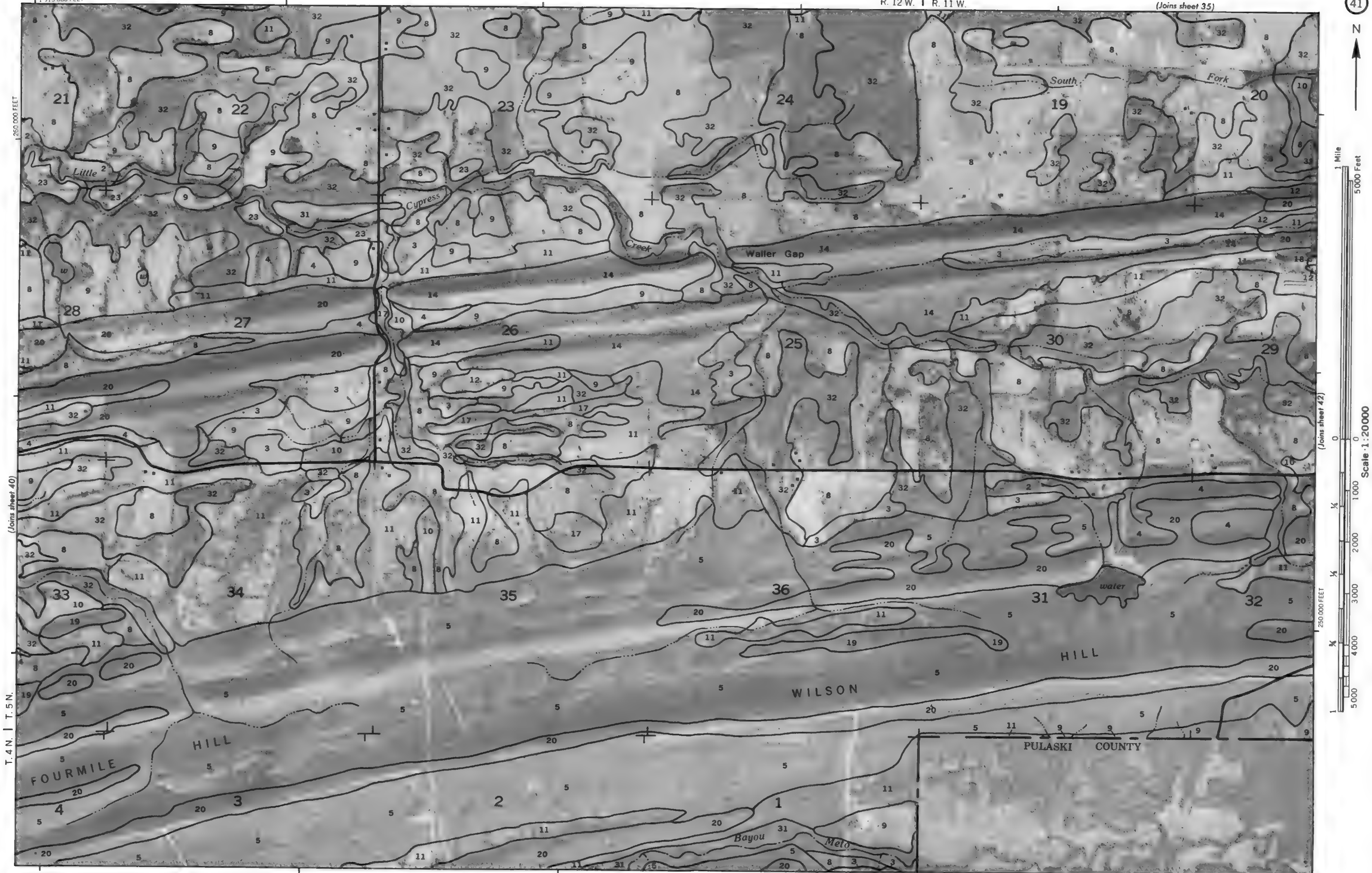
FAULKNER COUNTY, ARKANSAS NO. 39

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



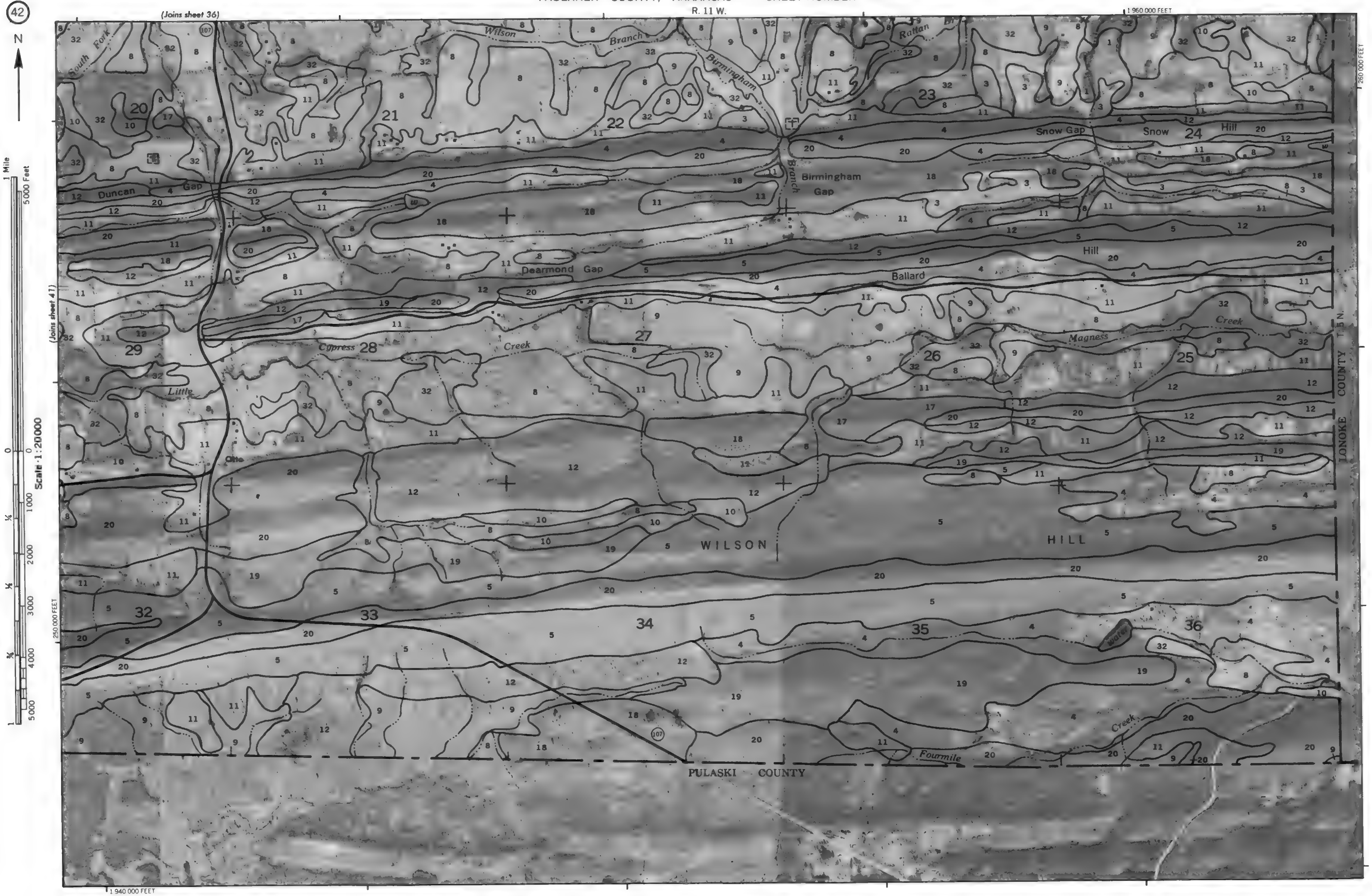
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 40



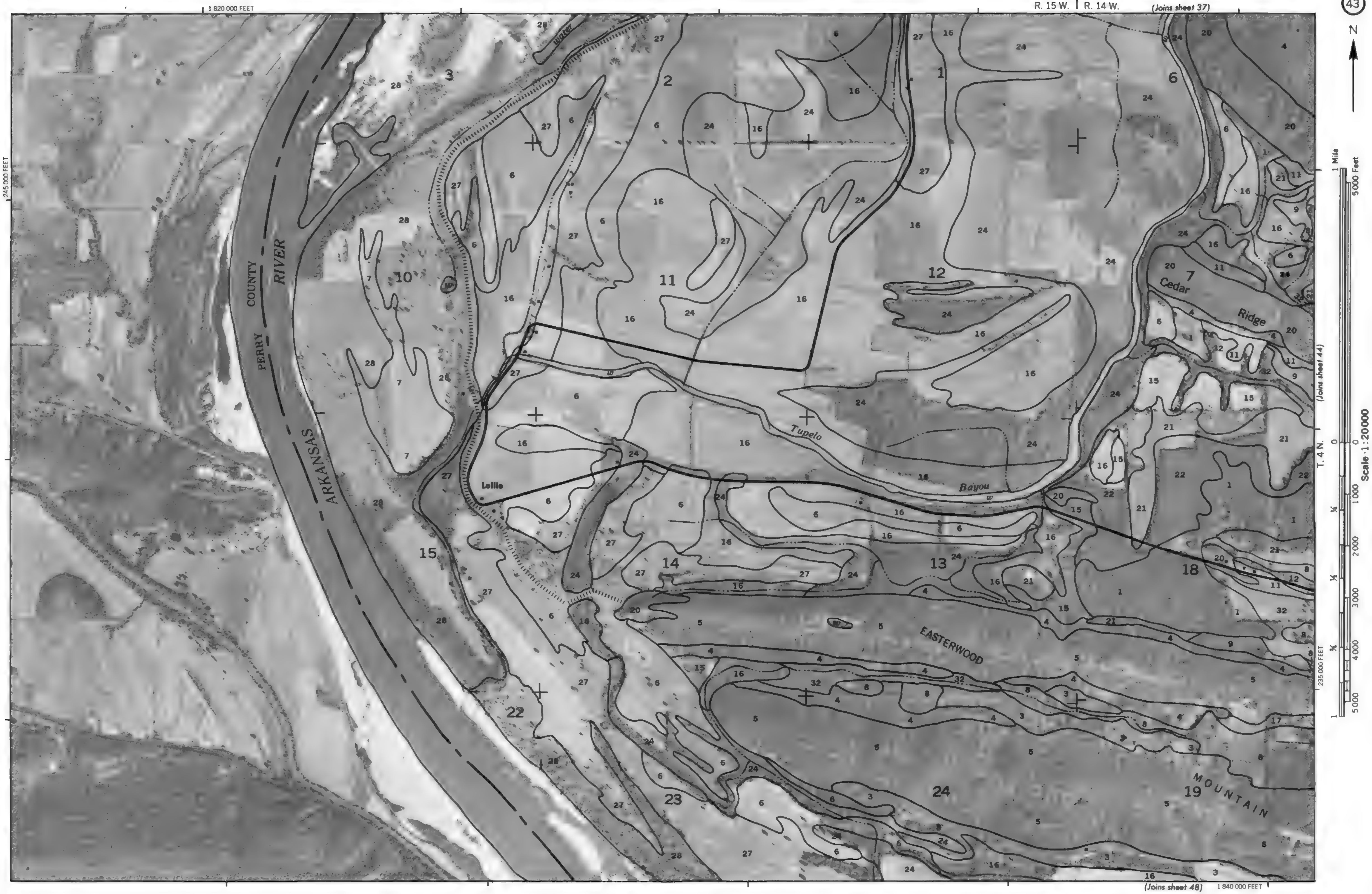
FAULKNER COUNTY, ARKANSAS NO. 41

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



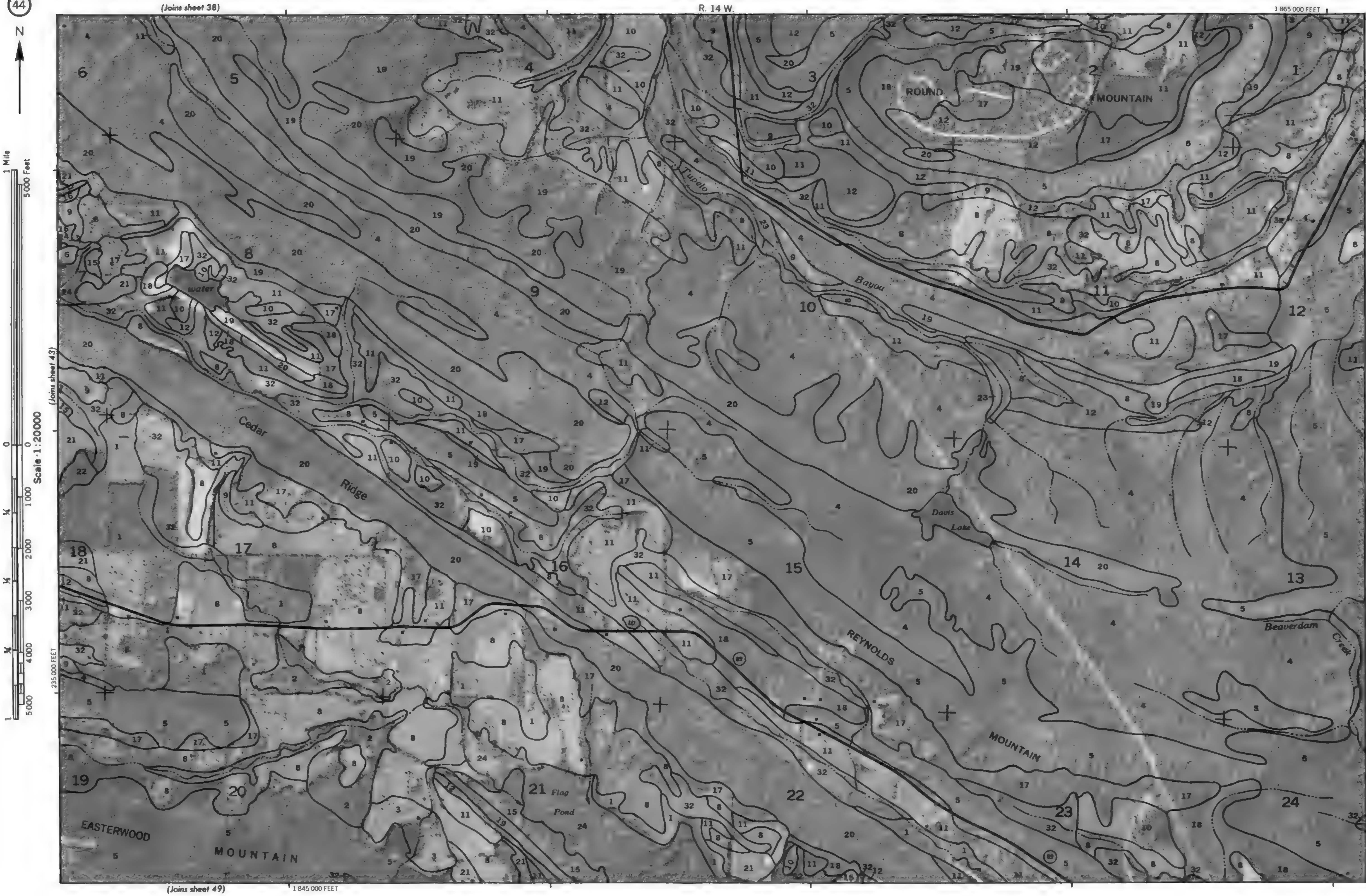
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

FAULKNER COUNTY, ARKANSAS NO. 42



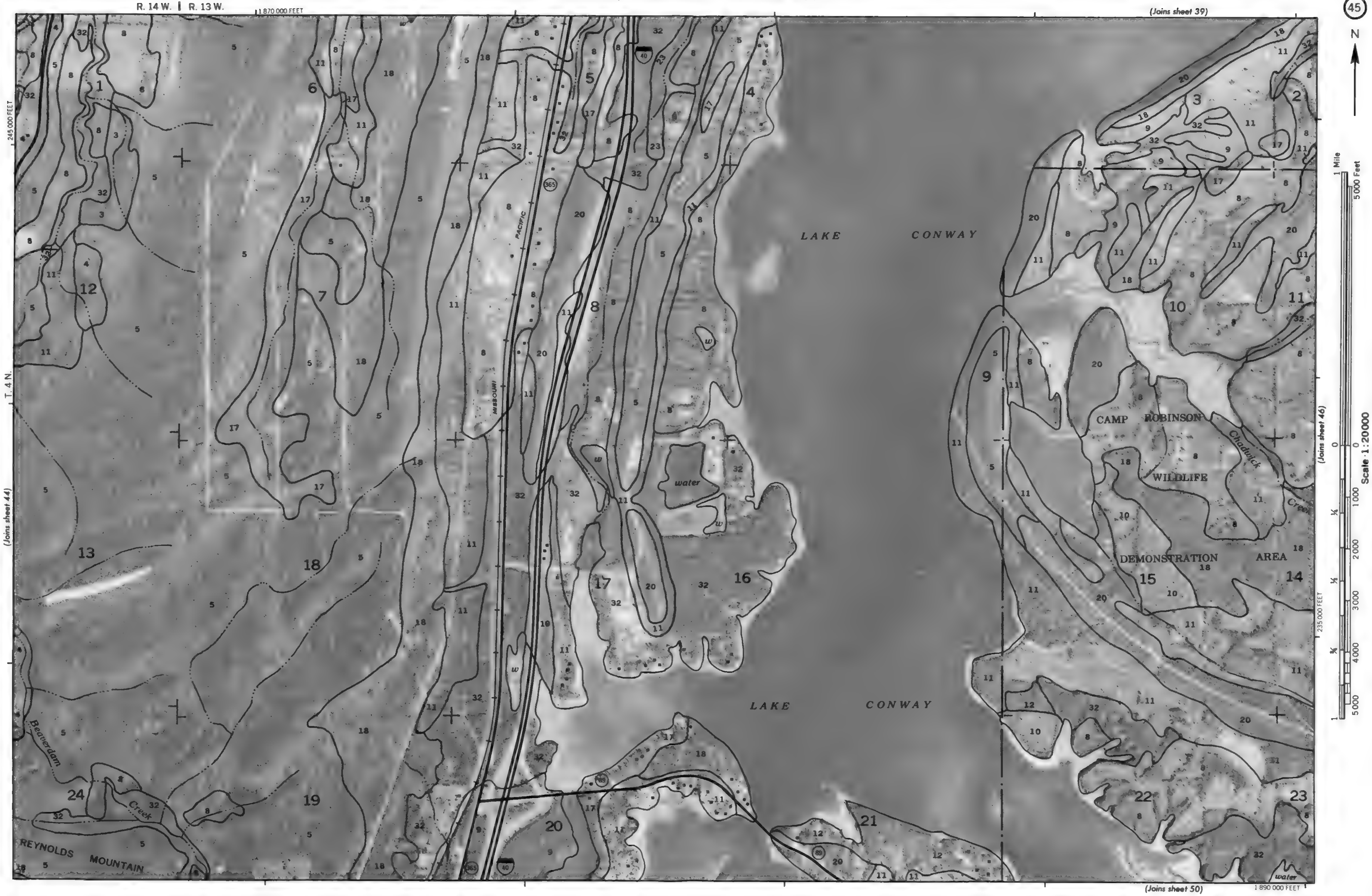
FAULKNER COUNTY, ARKANSAS NO. 43

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

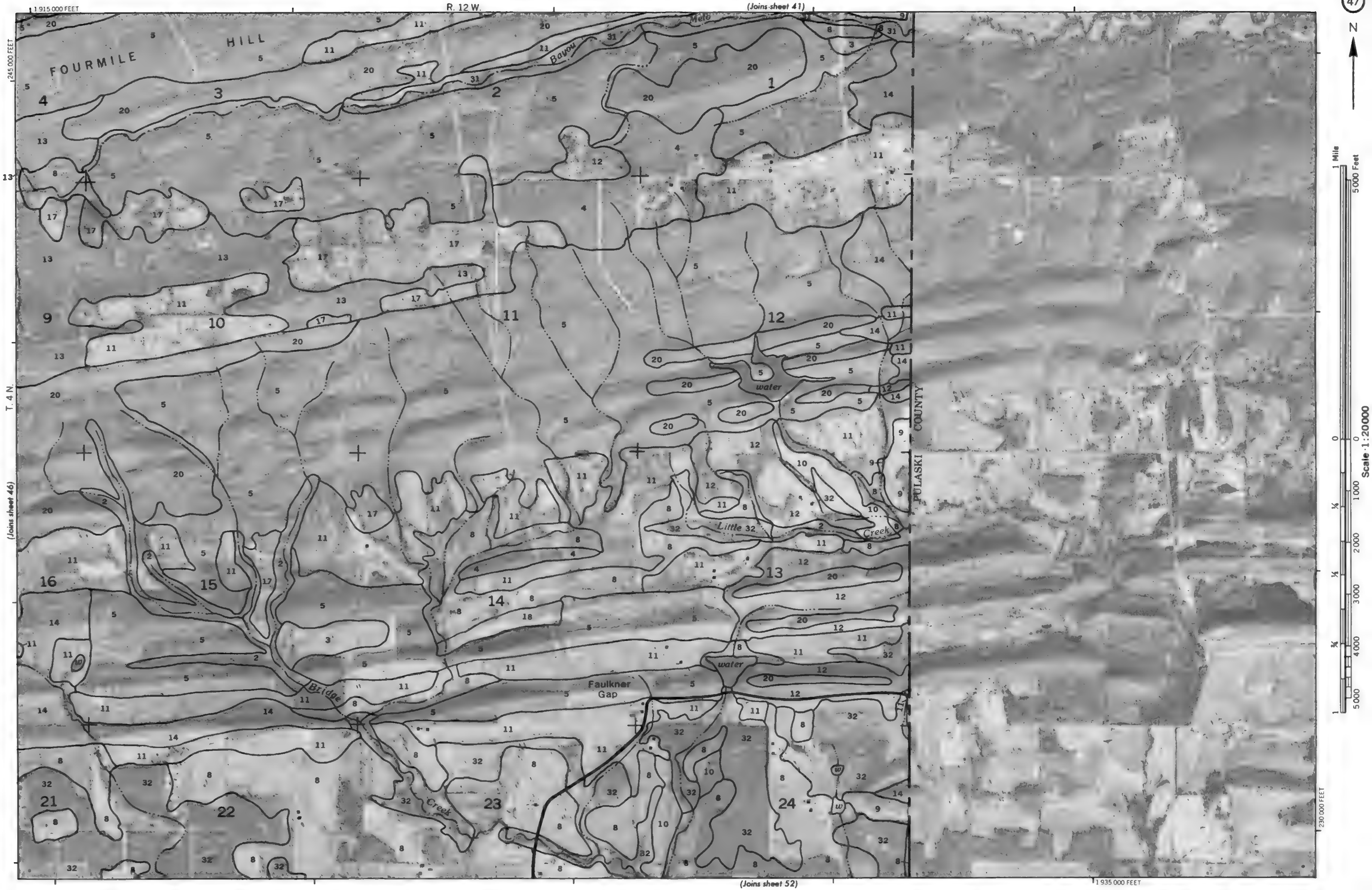
FAULKNER COUNTY, ARKANSAS NO. 44



FAULKNER COUNTY, ARKANSAS NO. 45

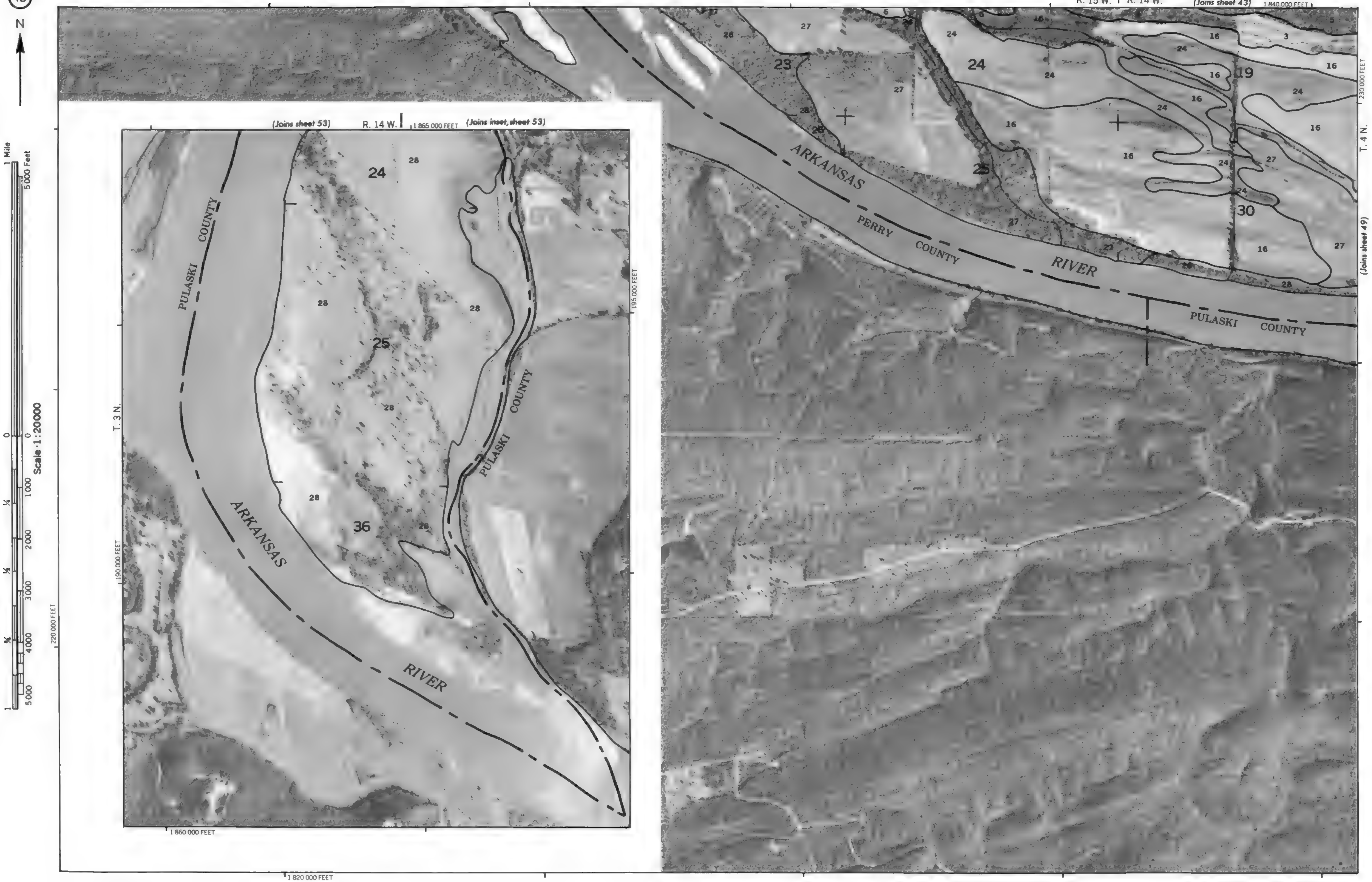
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



FAULKNER COUNTY, ARKANSAS NO. 47

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

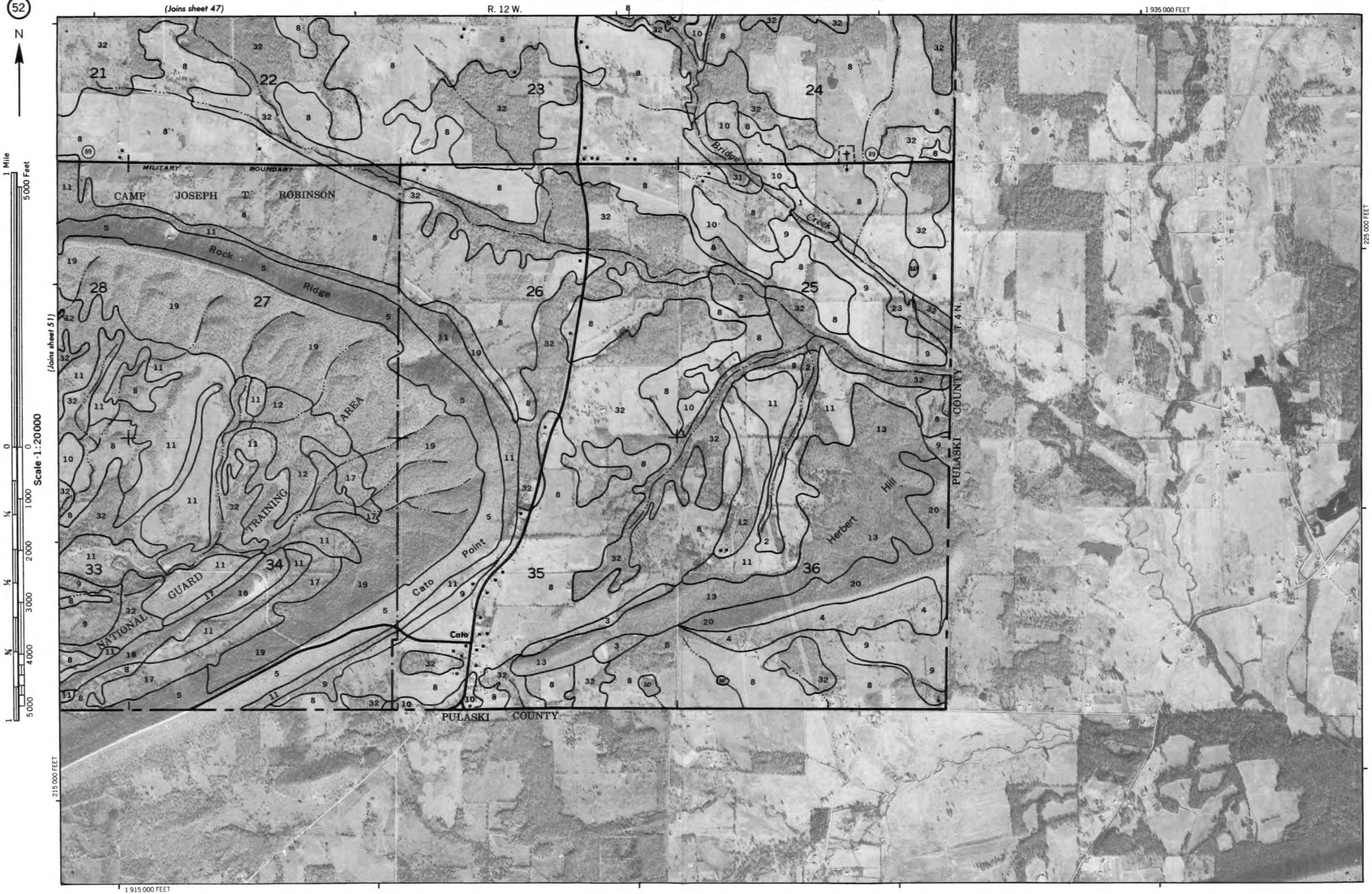
N

Scale 1:20000

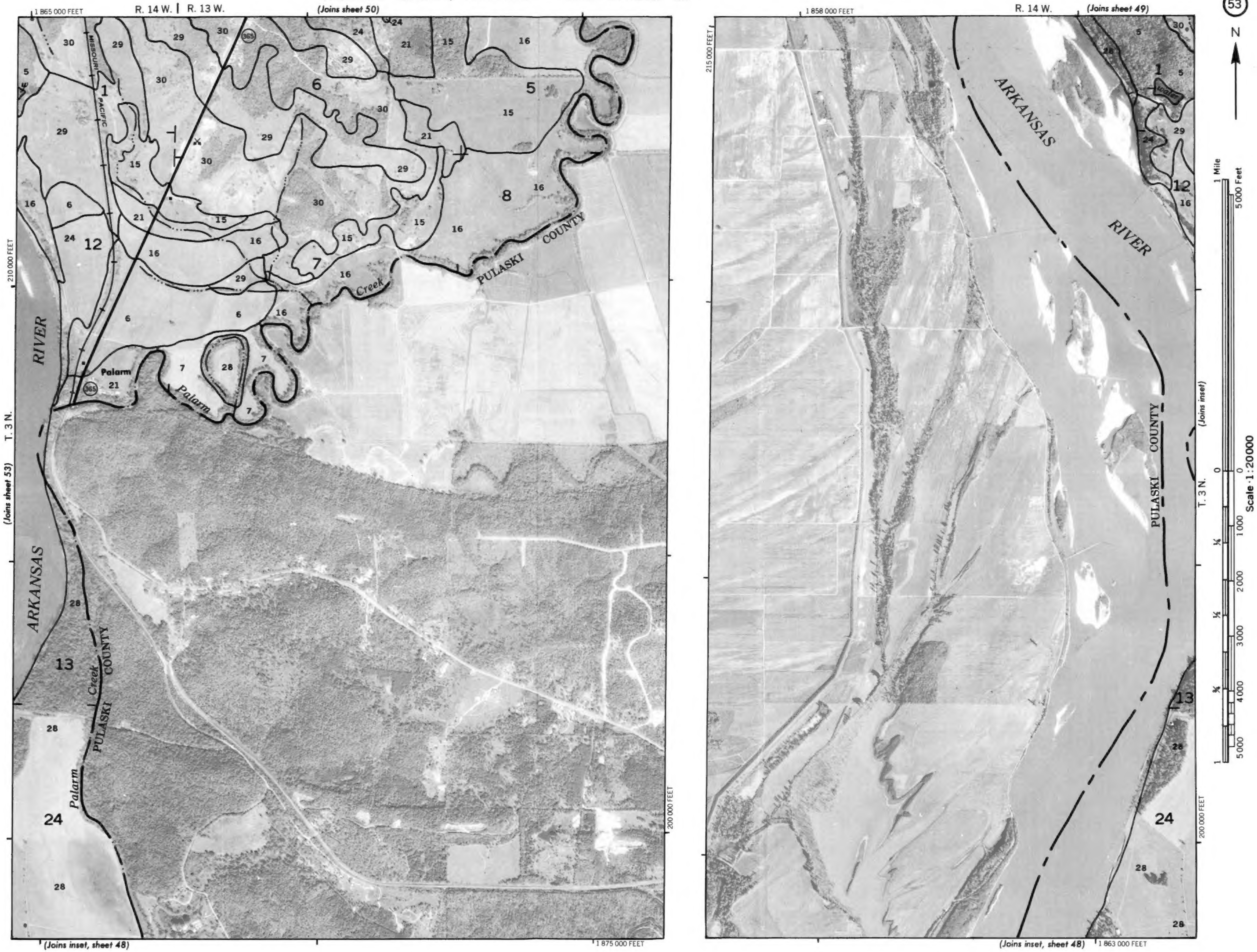
1 Mile

5000 Feet

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



FAULKNER COUNTY, ARKANSAS NO. 53

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.